USER MANUAL
HERTZINNO
ACOUSTIC CAMERA

Shanghai Hertzinno Technology Co., Ltd

Notice to User

Important note

Before operating the device, you must read, understand, and follow all instructions, warnings, cautions, and legal disclaimers.

Důležitá poznámka

Před použitím zařízení si přečtěte veškeré pokyny, upozornění, varování a vyvázání se ze záruky, ujistěte se, že jim rozumíte, a řiďte se jimi.

Vigtig meddelelse

Før du betjener enheden, skal du du læse, forstå og følge alle anvisninger, advarsler, sikkerhedsforanstaltninger og ansvarsfraskrivelser.

Wichtiger Hinweis

Bevor Sie das Gerät in Betrieb nehmen, lesen, verstehen und befolgen Sie unbedingt alle Anweisungen, Warnungen, Vorsichtshinweise und Haftungsausschlüsse

Σημαντική σημείωση

Πριν από τη λειτουργία της συσκευής, πρέπει να διαβάσετε, να κατανοήσετε και να ακολουθήσετε όλες τις οδηγίες, προειδοποιήσεις, προφυλάξεις και νομικές αποποιήσεις.

Nota importante

Antes de usar el dispositivo, debe leer, comprender y seguir toda la información sobre instrucciones, advertencias, precauciones y renuncias de responsabilidad.

Tärkeä huomautus

Ennen laitteen käyttämistä on luettava ja ymmärrettävä kaikki ohjeet, vakavat varoitukset, varoitukset ja lakitiedotteet sekä noudatettava niitä.

Remarque importante

Avant d'utiliser l'appareil, vous devez lire, comprendre et suivre l'ensemble des instructions, avertissements, mises en garde et clauses légales de non-responsabilité.

Fontos megjegyzés

Az eszköz használata előtt figyelmesen olvassa el és tartsa be az összes utasítást, figyelmeztetést, óvintézkedést és jogi nyilatkozatot.

Nota importante

Prima di utilizzare il dispositivo, è importante leggere, capire e seguire tutte le

istruzioni, avvertenze, precauzioni ed esclusioni di responsabilità legali.

重要な注意

デバイスをご使用になる前に、あらゆる指示、警告、注意事項、および免責条項をお読み頂き、その内容を理解して従ってくだ さい。

중요한 참고 사항

장치를 작동하기 전에 반드시 다음의 사용 설명서와 경고, 주의사항, 법적 책임제한을 읽고 이해하며 따라야 합니다.

Viktig

Før du bruker enheten, må du lese, forstå og følge instruksjoner, advarsler og informasjon om ansvarsfraskrivelse.

Belangrijke opmerking

Zorg ervoor dat u, voordat u het apparaat gaat gebruiken, alle instructies, waarschuwingen en juridische informatie hebt doorgelezen en begrepen, en dat u deze opvolgt en in acht neemt.

Ważna uwaga

Przed rozpoczęciem korzystania z urządzenia należy koniecznie zapoznać się z wszystkimi instrukcjami, ostrzeżeniami, przestrogami i uwagami prawnymi. Należy zawsze postępować zgodnie z zaleceniami tam zawartymi.

Nota importante

Antes de utilizar o dispositivo, deverá proceder à leitura e compreensão de todos os avisos, precauções, instruções e isenções de responsabilidade legal e assegurar-se do seu cumprimento.

Важное примечание

До того, как пользоваться устройством, вам необходимо прочитать и понять все предупреждения, предостережения и юридические ограничения ответственности и следовать им.

Viktig information

Innan du använder enheten måste du läsa, förstå och följa alla anvisningar, varningar, försiktighetsåtgärder och ansvarsfriskrivningar. Önemli not Cihazı çalıştırmadan önce tüm talimatları, uyarıları, ikazları ve yasal açıklamaları okumalı, anlamalı ve bunlara uymalısınız.

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1.1 Online documentation

Our manuals are constantly updated and published online. To access the Hertzinno acoustic camera series user manual and other product documentation, go to http://hertzinno.com.

1.2 About this manual

HERTZINNO publishes generic manuals that cover several models within a camera series. This means that this manual may contain descriptions and explanations that do not apply to your specific camera model. The English language is the authoritative version of this publication. In the event of any discrepancy due to translation errors, the English text shall prevail. Any subsequent changes will be implemented in the English language first.

Safety information

1.3 Radio

WARNING！ ！ ！
This device complies with Part 15 of the FCC Rules and with Industry Canada licence-exempt RSS standard(s). Operation is subject to the following two conditions: 1. This device may not cause harmful interference, and 2. This device must accept any interference received, including interference that may cause undesired operation.

WARNING！ ！ ！
This device contains specified radio equipment that has been certified to the Technical Regulation Conformity Certification under the Japanese Radio Law.

WARNING！ ！ ！
This portable transmitter with its antenna has shown compliance with FCC's SAR limits for general population / uncontrolled exposure. The maximum listed SAR level is 1,5 W/kg (head) and 1,5 W/kg (body) at 0 mm. The antenna used for this device must not be co-located or operating in conjunction with any other antenna or transmitter

1.4 Handling and operation

WARNING！ ！ ！
If you do not obey these Warnings, injury to persons can occur. • Take special care around heavy machinery when carrying the camera using the neck strap. The neck strap is rigid and does not have a separate safety release mechanism. • Do not look directly into the laser beam. The laser beam can cause eye irritation. • Do not look directly into the LED lights placed on the microphone panel.

CAUTION！ ！ ！
Do not point the infrared camera at strong energy sources, for example, devices that cause laser radiation, or the sun. This can have an unwanted effect on the accuracy of the camera. It can also cause damage to the detector in the camera.

WARNING！ ！ ！

Do not disassemble or do a modification to the battery. The battery contains safety and protection devices which, if damage occurs, can cause the battery to become hot, or cause an explosion or an ignition.

CAUTION！ ！ ！

Do not point the infrared camera at strong energy sources, for example, devices that cause laser radiation, or the sun. This can have an unwanted effect on the accuracy of the camera. It can also cause damage to the detector in the camera.

CAUTION！ ！ ！

To prevent damage, put the protective cap on the thermal sensor when you do not operate the thermal.
Damage to the thermal sensor can occur if you do not do this.
Protect the camera and accessories from dirt, dust, impact, and liquids.
Protect the microphone panel from physical contact. Do not touch the microphone holes.
Keep the USB port covered to prevent water ingress.
Only use the accessories and spare parts that Hertzinno provides.
Do not disassemble the camera.
Do not use a damaged camera, battery or accessories.

Disclaimers

1. Legal Disclaimer

For warranty terms, please confirm with your local dealer.

2. Patents

This product is protected by patents, design patents, patents pending, or design patents pending.

3. Quality Assurance

The Quality Management System under which HERTZINNO products are developed and manufactured has been certified in accordance with the ISO 9001 standard.

HERTZINNO is committed to a policy of continuous development and reserves the right to make changes and improvements to any product without prior notice.

4. Third-Party Licenses

Information about third-party licenses is available in the product's user interface.

5. Usage Statistics

HERTZINNO reserves the right to gather anonymous usage statistics to help maintain and improve the quality of our software and services.

6. Copyright

1. Product Overview

1.1 Products

Hertzinno Acoustic Camera (HZ-HA-171P/HZ-HA-271P/HZ-HA-270P/HZ-HA-170P) is a specific device that uses microphone arrays to measure the sound field distribution within a certain range and can be used to measure the location of objects and the state of radiation and display an intuitive image in the form of a cloud map, i.e. acoustic imaging measurement.

HZ-HA-270P and HZ-HA-271P cameras not only have the functions of acoustic camera sound collection, image collection, and sound source positioning and visualization, but also is equipped with thermal imaging sensors to realize multiple detection and diagnosis of equipment failures.

The instrument supports audible sound and ultrasonic frequency bands, and can be used for sound source localization, abnormal sound testing, sound source trajectory tracking and positioning, etc. For steady-state or high-transient sound sources, static or moving objects, Hertzinno Industrial Imager can obtain excellent detection results. Currently, it is mainly used in scenarios such as high-pressure gas leakage detection and partial discharge detection of power systems.

The following usage scenarios apply:

Security field: it can be used for sudden loud sound monitoring, detecting whether there are sudden abnormal sounds in the environment.

Power field: the equipment supports ultrasonic signal acquisition, which can be used for abnormal monitoring of transformers, switchgear and other power equipment.

- HZ-HA-170P is ATEX certificated acoustic camera for gas leak and partial discharge detection.
- HZ-HA-270P is ATEX certificated acoustic and thermal camera for partial discharge detection, gas leak detection and temperature abnormal detection.
- HZ-HA-171P is a long operation battery acoustic camera for gas leak and partial discharge detection.
- HZ-HA-271P is a long operation battery acoustic and thermal camera for partial discharge detection, gas leak detection and temperature abnormal detection.

1.2 Product Features

- Acoustic Field Imaging
- Air Leak Detection
- Partial Discharge detection

- Mechanical Noise
- Parameter adjustment
- Photo taking and video recording
- System self-test
- System setting
- File management
- Cloud Management functions
- Thermal Imaging （HZ-HA-271P and HZ-HA-270P Support）

1.3 Specifications

1.3.1 Appearance

HZ-HA-171P View from the front, the rear and left.

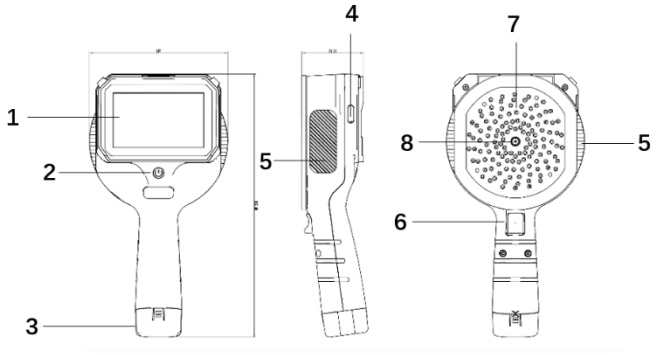


Figure 1.3.1 HZ-HA-171P

1. Screen
2. Power On/Off button
3. Battery cover
4. USB port
5. Heat sinks
6. Captain trigger
7. Microphones
8. Digital camera

HZ-HA-271P View from the front, the rear and left

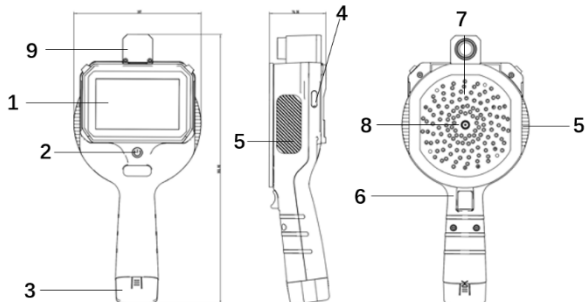


Figure 1.3.1.2 HZ-HA-271P

1. Screen
2. Power On/Off button
3. Battery cover
4. USB port
5. Heat sinks
6. Captain trigger
7. Microphones
8. Digital camera
9. Thermal camera

HZ-HA-270P View from the front, the rear and left

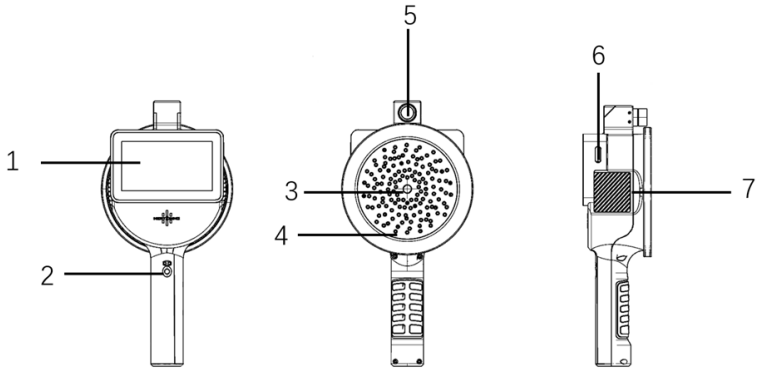


Figure 1.3.1.3 HZ-HA-270P

1. Screen
2. Power On/Off button
3. Optical camera
4. Microphones
5. Thermal camera lens
6. USB-Port
7. Heat sink

HZ-HA-170P View from the front, the rear and right.

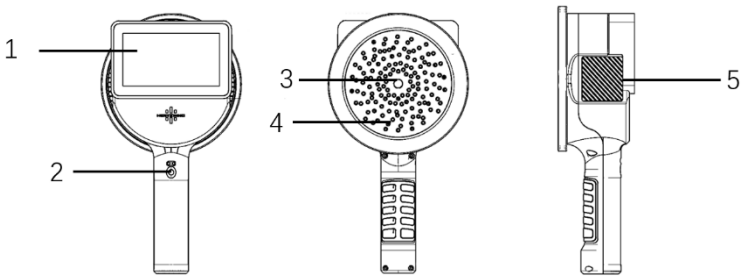


Figure 1.3.1.3 HZ-HA-270P

1. Screen
2. Power On/Off button
3. Optical camera
4. Microphones
5. Heat sink

1.3.2 Performance specifications

The parameters of HZ-HA-271P & HZ-HA-171P& HZ-HA-270P & HZ-HA-170P

Item	Parameters			
	HZ-HA-171p	HZ-HA-271p	HZ-HA-270P	HZ-HA-170P
Microphones	128	128	138	138
Sensor type	MEMS Acoustic sensors			
Frequency band	Auto, low, Medium, High and Ultra			
Measure distance	0.3m ~ 200m		0.3m ~ 210m	
Scenarios	Air Leak Detection, Partial Discharge Detection			
Dimension	314mm*167mm *89.9mm			
Weight	<1100g	<1200g	< 1000g	< 980g
Protection level	IP54			
Touchable Screen	5-inch LCD (Capacitive)			
Charging Type	Type-C/ Replaceable battery/Charging docker		Type-C	
Screen	1280*720p/1000nits			
Imaging Resolution	4k,1080P			
Video Frame rate	30fps			
Sound Imaging frame rate	30fps			
Optical Camera	13MP			
FOV of Camera	75°			
Date Transfer	USB/WIFI			
Internal storage	64GB			
Endurance	7 hours with a single battery		4 hours operation	
Sensor self-test	YES			
Thermal sensor	NA	YES	YES	NA

1.4 Serial number

A label with the serial number is available at the top of the camera.

The serial number is also available in the camera system setting.

1.5 Package list

No.	Item	QTY	Note
1	Industrial Imager	1	
2	Replaceable Battery	2	One set is mounted on device
3	Type-C Cable	1	
4	Power Adaptor	1	
5	U disk	1	
6	Battery Docker	1	
7	Quick User Guide	1	Qualification card and warranty card
8	Test report from factory	1	

2. Function Instruction

2.1 Basic Hardware Function description

2.1.1 Power On/Off

- Long-press the power switch button at the handle for about 1s to turn on the device. When the device is running, the operation indicator light stays on.
- When the device is turned on, long-press the power button for 3s, the shutdown dialog window will pop up.
- Long-press the power button for 6s, turn off the device directly.

2.1.2 Charging

The device has a replaceable and rechargeable battery.

Method 1

Use the Power adaptor charger that comes with the device to connect to the type-c port at the lift side of camera.

Method 2

Use the power adaptor charge that comes with the device to connect to the type-c port at the rear of charger dock.

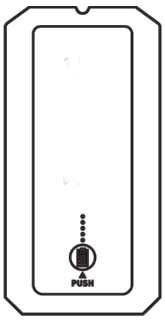
Put the battery on the charger dock, then charge the battery.

When the power is turned on, the charging indicator is red, indicating that it is charging; when the charging indicator turns green, indicating that the device is fully charged.

2.1.3 Battery(Only 271P & 171P)

The purpose of using the spare battery is to increase the battery life of the device, you can replace the battery with spare battery.

The battery has an indicator with five LEDs (indicating 20%, 40%, 60%, 80%, 100% charge) and a test button. To check the battery level, press the test button. The LEDs will light up to indicate the battery level. If all five LEDs are on, the available battery level is 100%.



2.2 User Interface

The acoustic camera supports partial discharge mode and gas leak mode.

After the device is turned on, it shows Logo Page, and then it enters the main interface, and the video stream is displayed on the screen.

Figure 2.2.1 LOGO PAGE

As HZ-HA-271P supports thermal imaging function, the Thermal & acoustic camera shows the main page likes below.

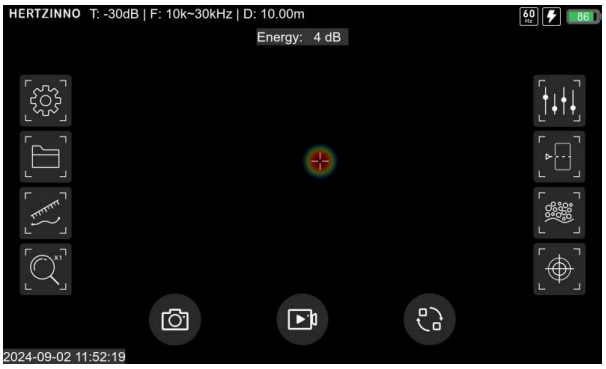


Figure 2.2.2 Thermal Acoustic Switch

For HZ-HA-171p, the main page is like figure 2.2.3.

Figure 2.2.3 HZ-HA-171p Page

The upper left corner is “LOGO”, “detection threshold”, “detection frequency range” and “distance settings information”.

Partial discharge detection mode:

Gas leak detection mode:

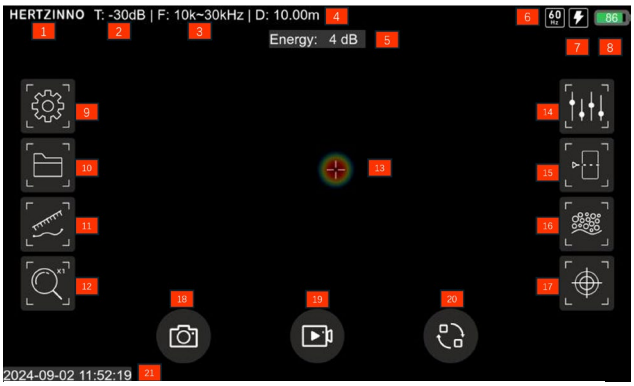


Figure 2.2.4 Partial Discharge Mode

Figure 2.2.5 Gas leak Mode

Mechanical Noise mode:

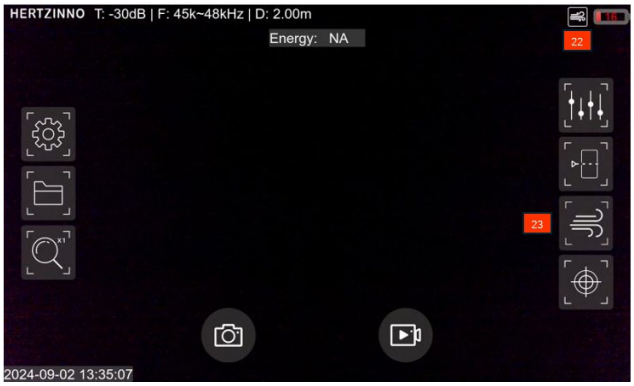


Figure 1

2.2.1 Take Picture

Tap the camera icon to take a photo, The photo will be saved in jpg format. You can view the saved photo information in the file management(album).

After taking a photo, the camera automatically pops up Photo annotation, click the button below to add text notes, image notes, tag notes and file saving operations.

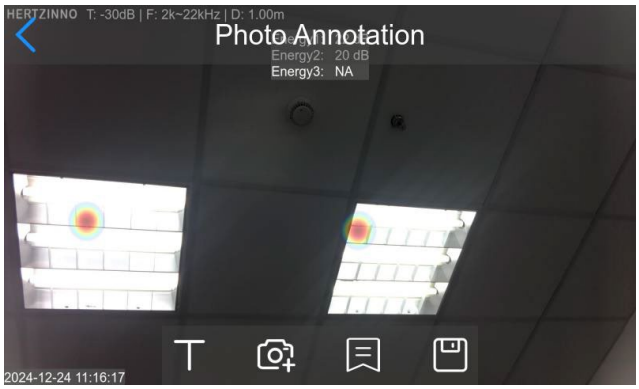


Figure 2.2.1.1 Photo Annotation

2.2.2 Video Record

Tap the icon to take a video, The video will be saved in mp4 format. You can view the saved photo information in the file manager.

2.2.3 Acoustic & Thermal mode switch (Thermal Mode only)

When the device is turned on, it works in the acoustic detection mode by default. Click on the switch icon to switch between acoustic detection mode and thermal imaging mode.

The camera and video recording functions support acoustic mode, thermal mode and acoustic & Thermal overlay.

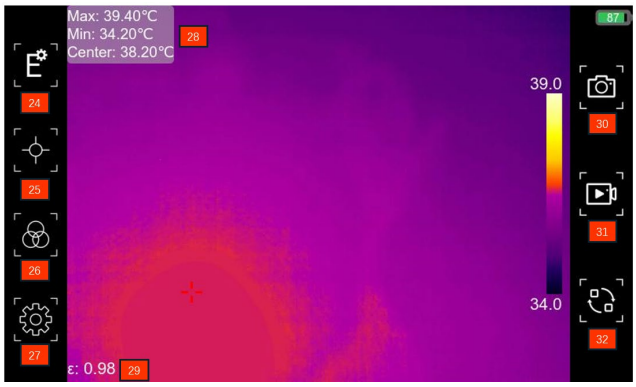


Figure 2.2.3 Thermal Imaging Mode

1. LOGO
2. Threshold: The threshold setting of the sound field imaging (unit: dB)
3. Frequency band: Indicating the real-time frequency band setting range
4. Distance: The setting of measure distance.
5. Energy: Energy test result.
6. PRPD Reference Frequency: The frequency of the current PRPD-adapted AC current.
7. Partial discharge icon.
8. Battery: Display battery level.
9. Settings: Enter system setting page.
10. File Management: Check video and photo.
11. Distance: Input distance for a note.
12. Zoom: Magnify image for 2x, 4x and 8x zoom.
13. Sound map icon: Calculated Sound Map and Real Sound Field.
14. Frequency range adjustment: Adjust detect range.
15. Threshold Adjustment: Adjust the minimum energy level.
16. PRPD function: Enable/disable PRPD Imaging.
17. Multiple targets function: Switch camera from single targets to 3 targets.
18. Photo: Click to take a photo.
19. Video: Click to make a video record.
20. Thermal mode.
21. Date and time.
22. Gas leak icon: Indicate the current model of the camera.
23. Gas leak calculation: Enable/disable leak cost.
24. Emissivity： Modify the measure thermal.
25. Measurement Area： Temperature measurement setting.
26. Pseudo color: Select different pseudo color type.
27. Settings: System settings.
28. Temperature: Real-time temperature.
29. Emissivity parameters: Current parameter.
30. Photo: Take a photo.
31. Video: Make a video record.
32. Acoustic mode switch: switch to acoustic & thermal overlay mode.

2.2.4 Adjustment of parameters

Clicking on different setting buttons to adjust the corresponding parameters to optimize the measurements.

2.2.4.1. Adjustment of frequency band

The frequency band adjustment function has two types: **Fast frequency mode** and **Advanced frequency mode**.

The default mode is **Fast frequency adjustment** mode.

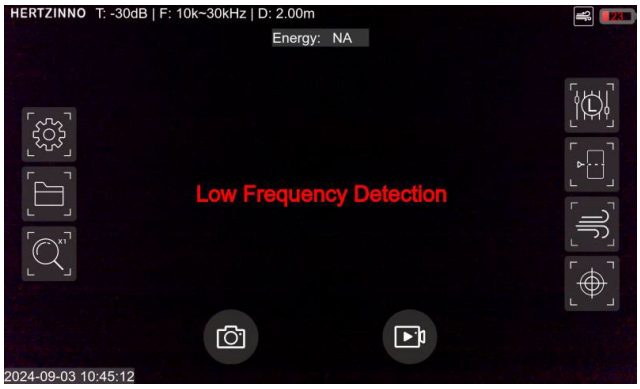


Figure 2.2.4.1 Fast frequency mode

Users can enable the Spectrum Display function from acoustic setting to activate the advanced frequency mode.

The Spectrum Display function can be turned on or off in the Acoustic settings.

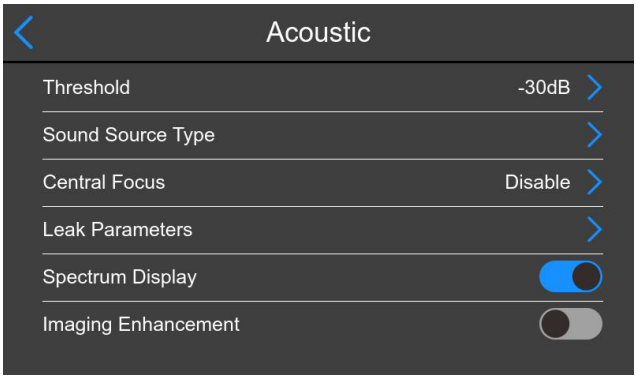


Figure 2.2.4.2 Spectrum Display for manual adjust

Fast frequency mode

Users can select the following frequency bands in different modes to configure the range of sound bands measured by the current device.

Selectable Frequency Setting	Frequency Range	Application
Low Frequency Level	10kHz-30kHz	It is mainly used to measure gas leakage within the audible range and is easily disturbed by environmental noise. It is suitable for situations where the background noise is small and can provide the best detection distance;
Mid Frequency Level	20kHz-40kHz	It can filter out most of the environmental noise and ensure a long detection distance, the recommended range.
High Frequency Level	30kHz-48kHz	It can filter out the influence of environmental noise to a great extent, and the detection distance is relatively short;
Ultra-High Frequency Level	45kHz-100kHz	It can basically filter out environmental noise interference and is suitable for close-range detection.

Advanced frequency Mode

The advanced frequency mode (real-time frequency band display function) can be turned on or off in the imaging settings, see Figure 2.2.4.2 Imaging Settings.

Select the frequency band by sliding the frequency adjustment bar to set the acoustic range to be measured by the device.

press and hold the frequency band with two fingers to pinch and stretch to adjust the imaging frequency band width.

By adjusting the frequency band, you can select the sound of a specific frequency band, effectively eliminating environmental interference and facilitating quick capture and location of the target sound source. (Minimum range is 2kHz, maximum range is 20kHz)

Figure 2.2.4.3 Real-time frequency band

Note: The frequency band cannot be manually adjusted in Fast frequency Mode.

2.2.5 Threshold adjustment

Click the Threshold button . Slide Threshold to adjust the threshold value. When the energy value of an object is above the threshold, the sound source is displayed on the screen.

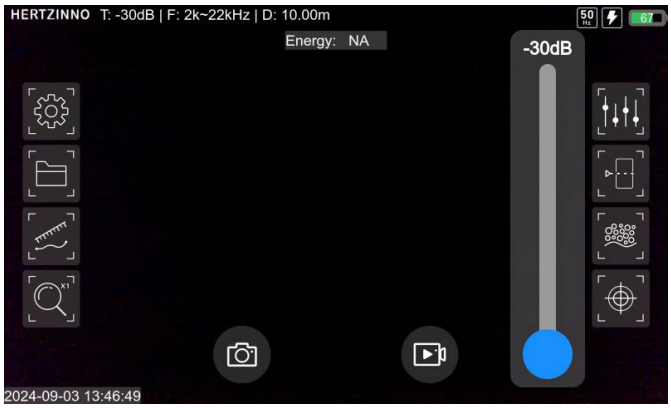


Figure 2.2.5 Threshold Adjustment

2.2.6 Thermal Imaging Function (HZ-HA-271P)

In the acoustic detection mode, click the Mode switch button to switch to thermal imaging mode. It displays the temperature distribution of the target device and the surrounding environment in real time, click the switch button, camera will turn to overlay mode.

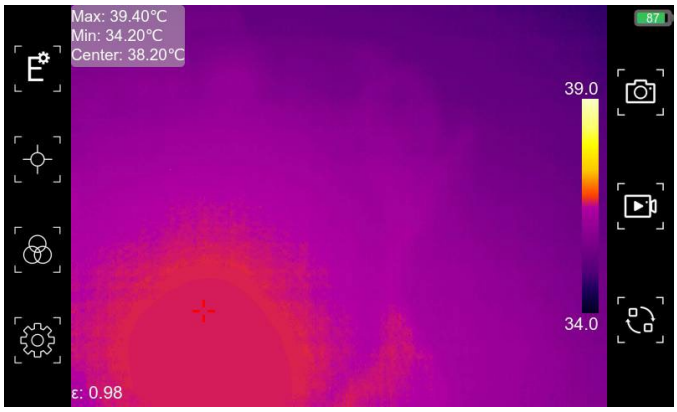


Figure 2.2.6 Thermal Imaging

Figure 2.2.6.2 Overlay mode of acoustic & thermal

2.2.7 Multiple Targets

The acoustic camera supports multiple targets function, Click the , the camera supports detect up to 3 targets at the same time.

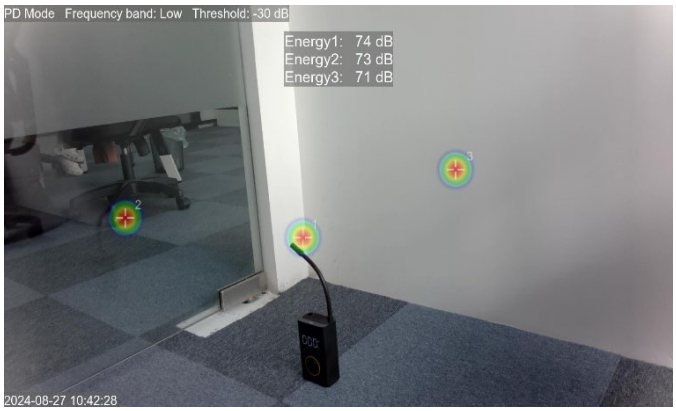


Figure 2.2.7 Multiple targets enabled

Note:

When the multi-target function is enabled, the camera only supports the calculation of the strongest signal information.

The Centre Focus mode and the multi-targets feature are mutually exclusive.

2.3 System setting

Click the Settings button to enter the system settings interface.

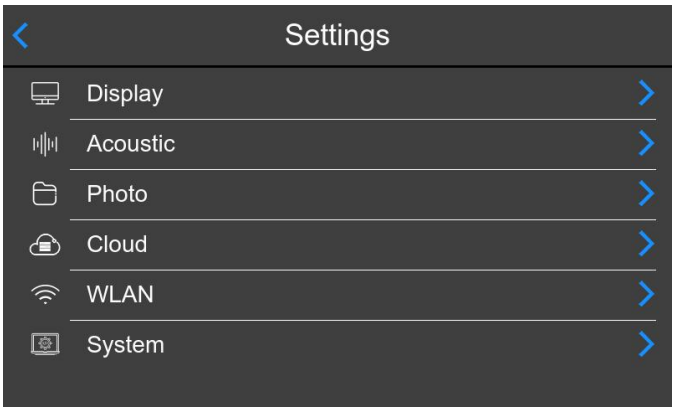


Figure 2.3 Settings interface

2.3.1 Display

The Display interface includes brightness, watermark information and main page button Icon.

Figure 2.3.1.1 Display

The brightness, user can change the brightness of screen by selecting the number, 1 means the darkness, and 100 means the brightness.

Date & Time: Shows date and time on screen or not.

Acoustic details: Shows threshold, frequency range and distance information on screen or not.

Icon Hide: Shows adjustments icon on screen or not.

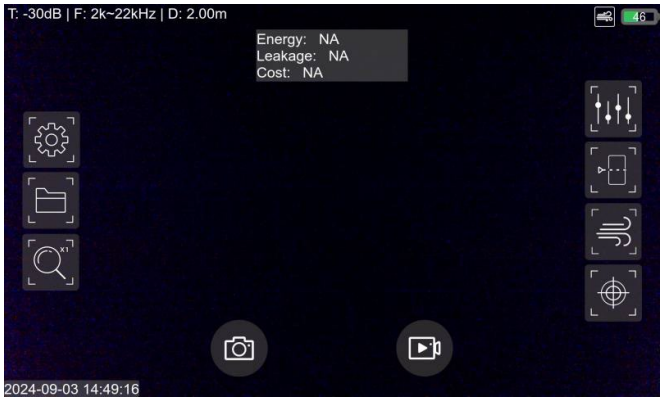


Figure 2.3.1.2 Logo Enable Display

Figure 2.6.1.3 Logo disable Display

2.3.2 Acoustic

Acoustic menu includes acoustic threshold adjustment, sound source type selects, center focus, PD Parameters (PD mode only, refer figure 2.6.2.1), Leak Parameters (Leak mode only, refer figure 2.6.2.2), Spectrum Display, and Imaging enhancement.

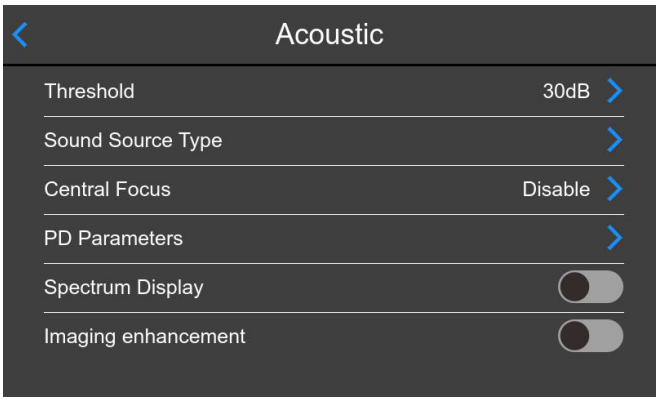


Figure 2.3.2.1 PD Parameters

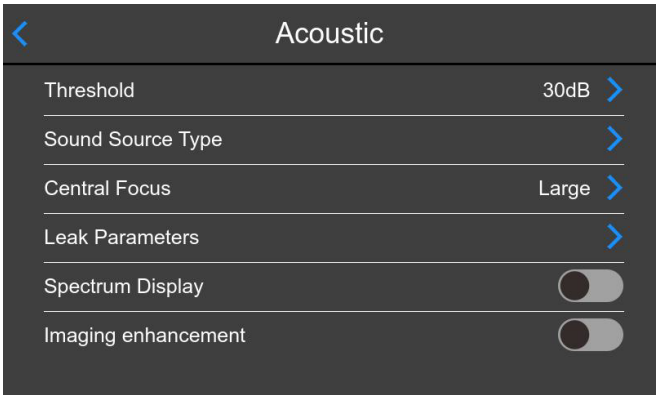


Figure 2.3.2.2 Leak Parameters

2.3.2.1. Threshold

The same function as 2.2.5, user can adjust the threshold to flit the small signal.

2.3.2.2. Sound source type

Hertzinno acoustic camera supports calculated sound field and Real sound field.

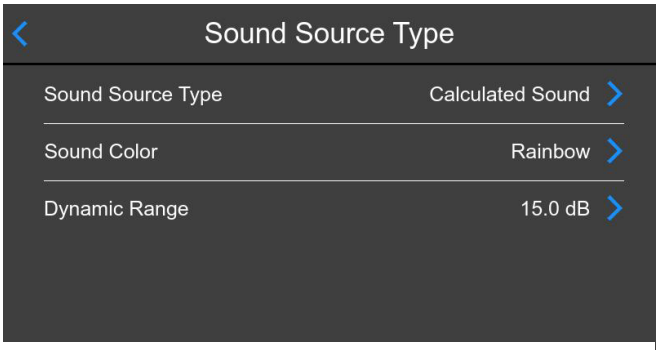


Figure 2.3.2.2.1 Sound Source Type

Calculated sound is a mode that presents a stable sound field effect based on the original sound field by filtering out extraneous signals through computation.

Figure 2.3.2.2.2 Calculated sound icon

Real sound field, which is used to directly present the sound field received by the microphone array, with real sound field enable, the multiple targets function cannot be used.

The camera supports adjust dynamic range to adjust the imaging result.

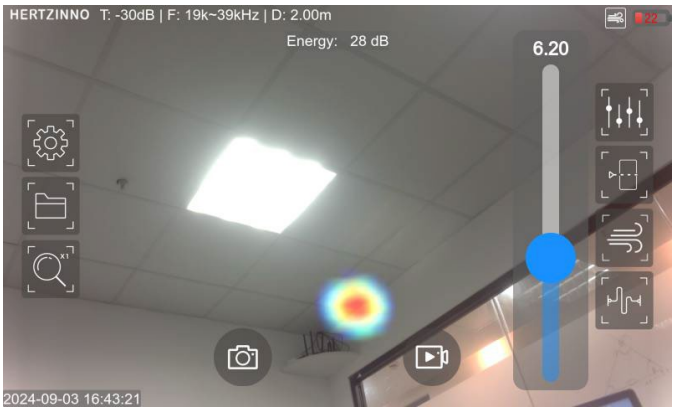


Figure 2.3.3.2.4 Dynamic Range Adjust

The camera supports 3 different color sound icon

Sound Color Select:

Dynamic Range: The dynamic range function just worked on real sound field mode; user can adjust dynamic range to change the sound field range.

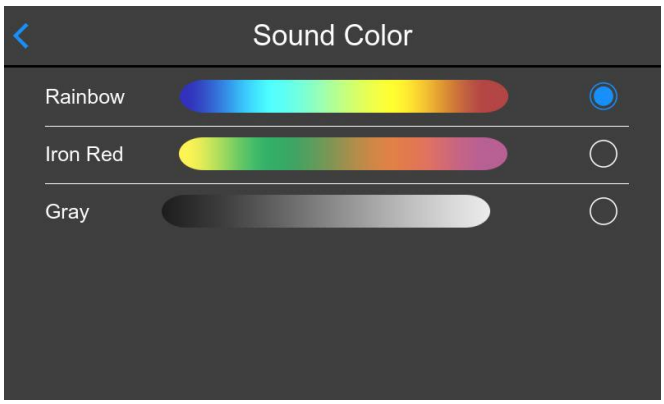


Figure 2.3.3.2.3 Sound color select

2.3.2.3. Central Focus

Users can filter signals outside the detection area through the function of central focus, and at the same time, centralize the arithmetic performance of the equipment to improve the sensitivity.

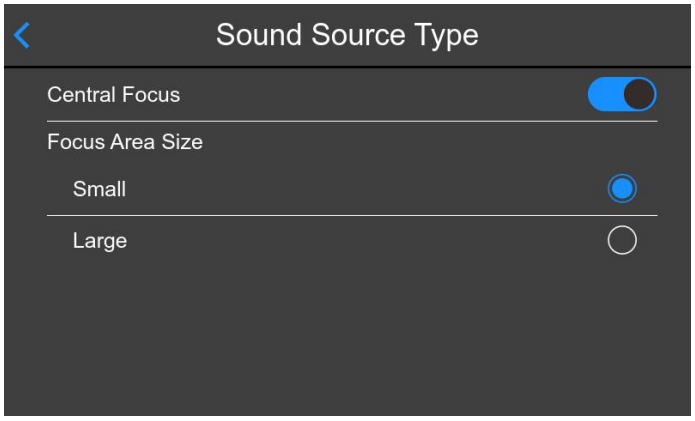


Figure 2.3.2.3.1 Central Focus

Enable central focus function, the multiple target function and imaging enhancement function will be blocked.

Figure 2.3.2.3.2 Central Focus enabled with small area

Central focus function supports small and large focus area.

Figure 2.3.2.3.3 Central Focus enabled with large area

2.3.2.4. Spectrum Display

Users can enable the Spectrum Display function from acoustic setting to activate the advanced frequency mode, reference 2.2.4.1

2.3.2.5. Imaging enhancement

The imaging enhancement function, through the acquisition of the signal for progressive processing, is used to enhance the stability of the image.

2.3.3 Photo

User can make photo settings under this function, such as photo resolution selection, photo watermark, and text note function (Photo Annotation) after taking photos.

2.3.3.1. Visible Light Photo Resolution

User can select the visible light photo resolution, 1080P and 4k.

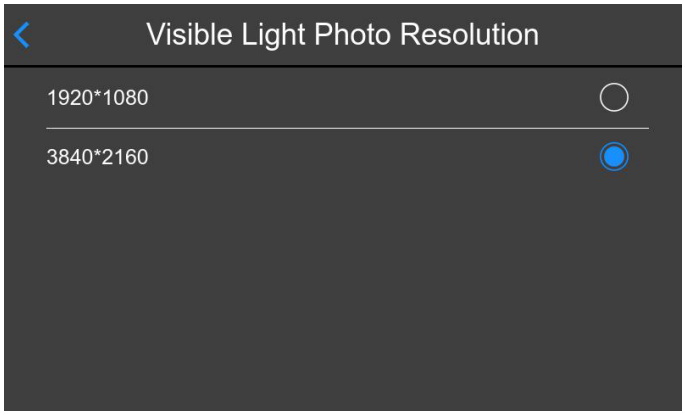
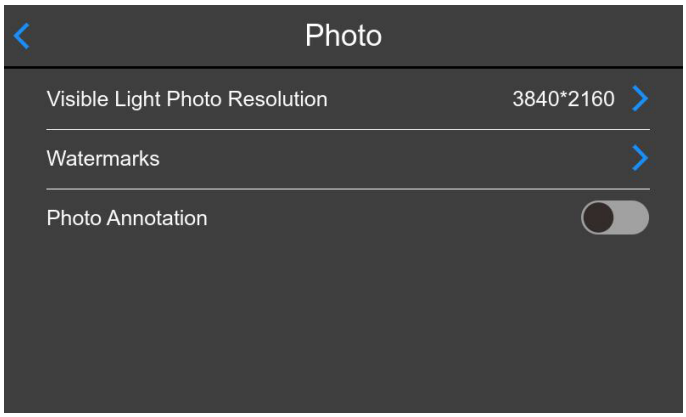


Figure 2.3.3.1.1 Photo resolution selection



2.3.3.2. Watermarks

User can choose these information needs to be saved on the captured photo, date and time, logo, and acoustic details.

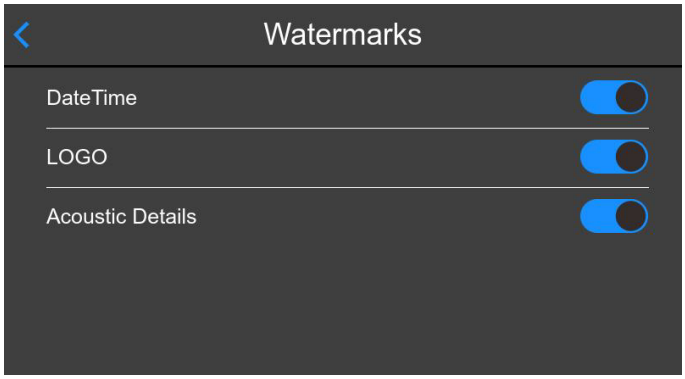


Figure 2.3.3.2.1 Watermarks

2.3.3.3. Photo Annotation

User can enable the photo annotation function to import a text note after take picture, it supports text, photos and tags.

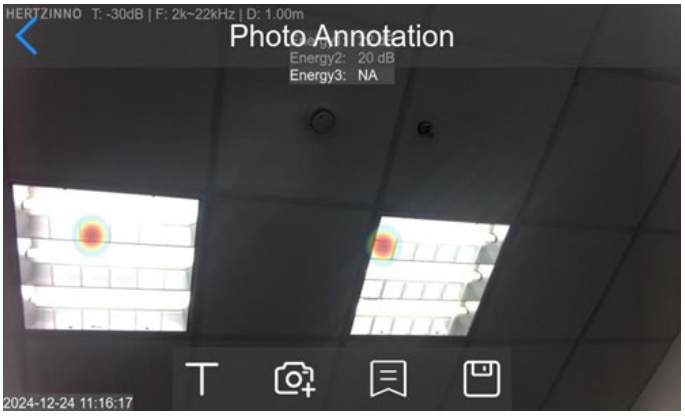


Figure 2.3.3.3.1 Photo Annotation

2.3.4 Cloud

The device supports the private cloud service function, please contact your local agent for details.

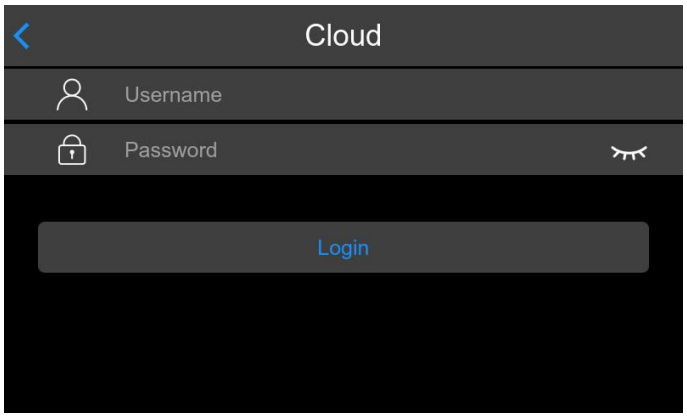


Figure 2.3.4.1 Cloud login

User can input a username and password to log into the cloud, after login, the device supports uploading acoustic files to cloud on file management page by clicking the icon .

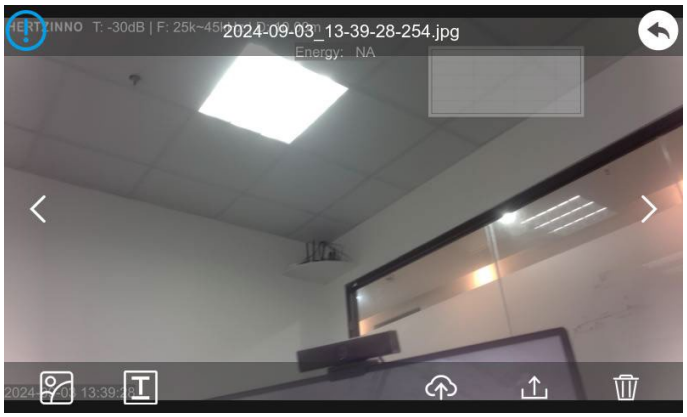


Figure 2.3.4.2 File upload feedback

2.3.5 WLAN

The camera supports 2.4GHz and 5G Wi-Fi, user can select the wireless signal to connect with. Enable the Wi-Fi function, the device will search signals automatically.

Figure 2.3.5.1 WIFI

Note: For cyber security, the device only supports the display of encrypted WIFI signals.

2.3.6 System

The camera system includes system information, system upgrade and about items, user can click these items to enter detail.

Figure 2.3.6.1 System Page

2.3.6.1. System Info

The camera system info includes Modes of camera, Unit of camera, Language, Data & Time Storage, Reset and Data delete function.

Work Modes

The acoustic camera supports partial discharge (PD) detection, gas leakage detection and Mechanical Noise, in the system info. Menu, the user can choose the mode according to their own needs.

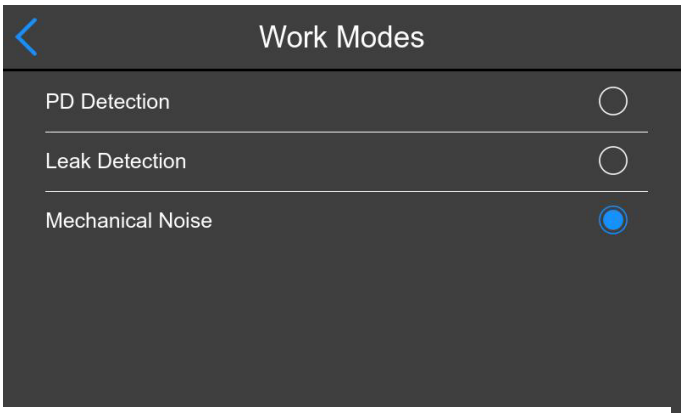


Figure 2.3.6.1.1 Device Mode

Unit Settings

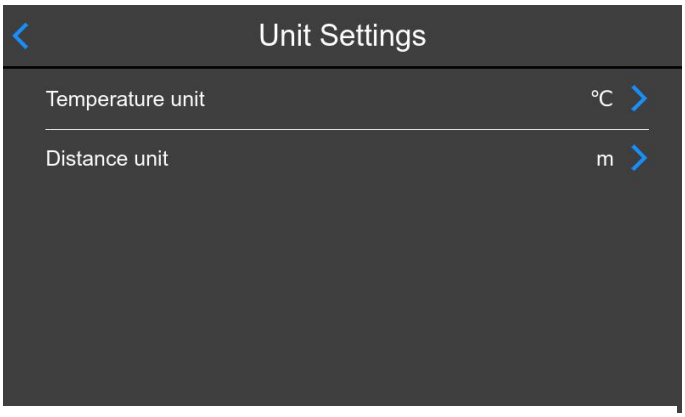


Figure 2.3.6.1.2 Unit settings

The unit settings include temperature unit set and distance unit set.

Temperature Unit include ℃, ℉ and K, Distance Unit includes m and ft.

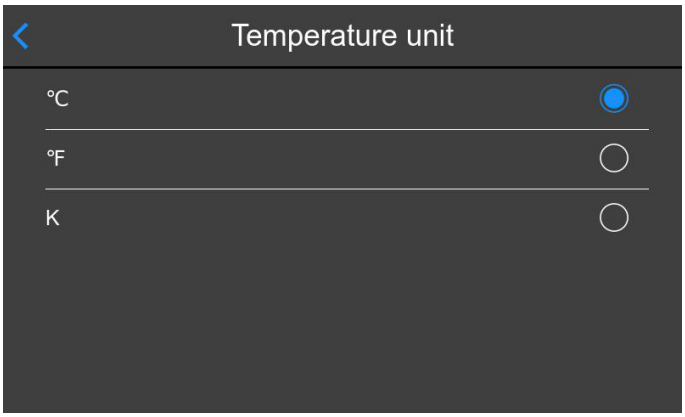


Figure 2.3.6.1.3 Temperature

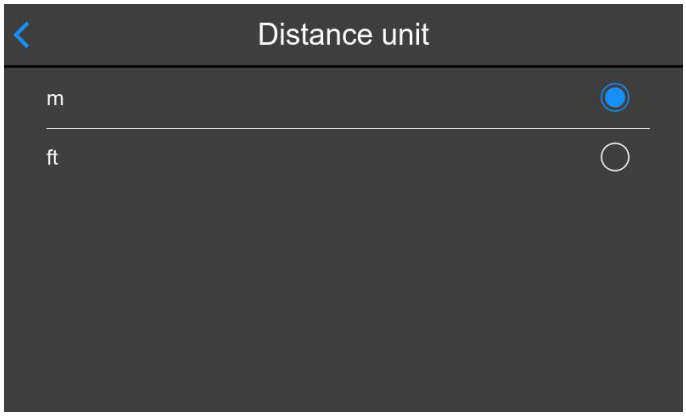


Figure 2.3.6.1.4 Distance unit

Language

Users can change the language of the camera on the language menu.

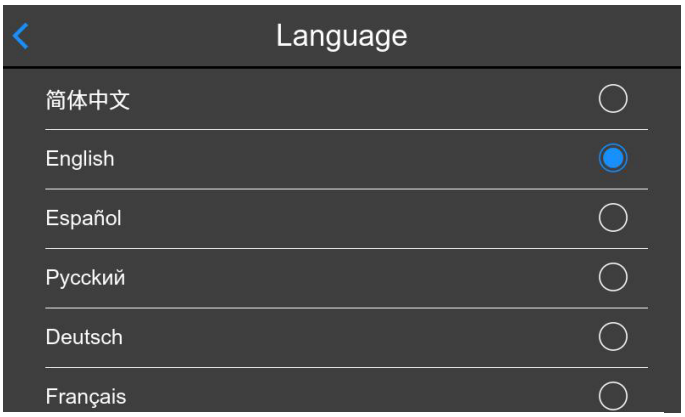


Figure 2.3.6.1.5 Language

Date & Time

Users can set the Date and Time with this function.

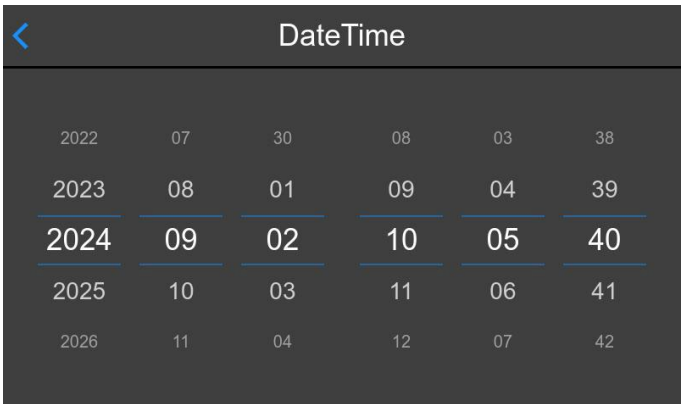


Figure 2.3.6.1.6 Date and Time

Storage

The default storage is 64 GB, and the system takes part of space.

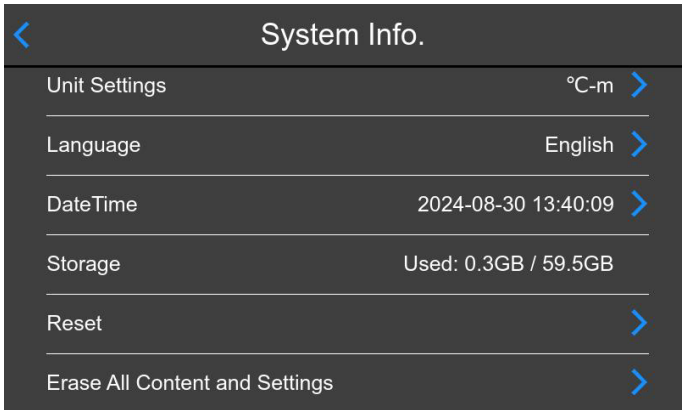


Figure 2.3.6.1.7 Storage

Reset

The reset function will restore the device and clean up all information.

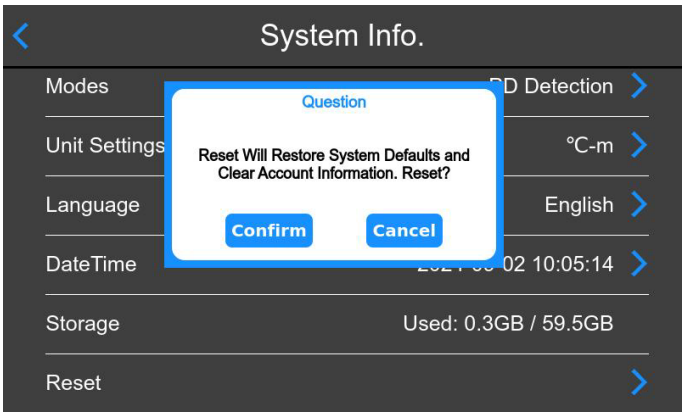


Figure 2.3.6.1.8 Reset

Erase all content and settings

This function will delete all photos and videos.

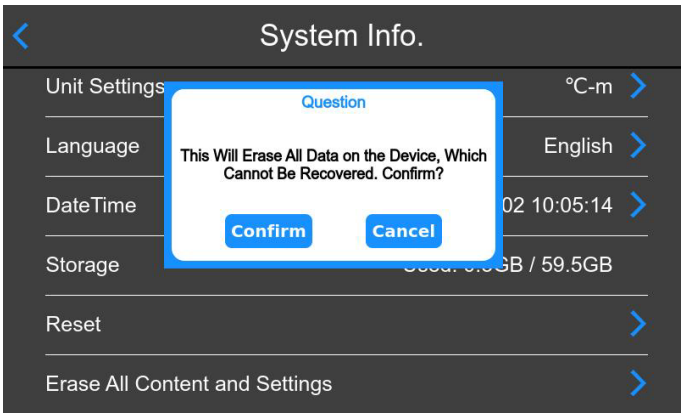


Figure 2.3.6.1.9 Erase all content and settings

2.3.6.2. System Upgrade

The camera supports OTA upgrade and local upgrade.

OTA upgrade based on cloud service, please contact local partner to get more information.

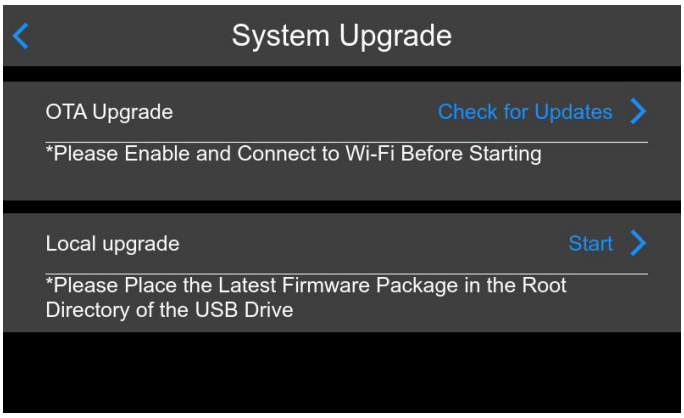


Figure 2.3.6.2.1 Upgrade

Local upgrade:

The camera supports upgrade with U-disk, copy the package (.zip) directly to U-disk and connect the u-disk with camera, click start.

2.3.6.3. About

In the About page, you can get the device SN, software version, firmware version, driver version, Battery level and usage time of current battery.

Figure 2.3.6.3 About Page

Note: The battery power display is based on the current battery voltage and current calculated in real time, the specific use time is related to the external environment, use habits.

2.4 File Management

User can click  to enter the file management page. On the file management page, users can check photos and videos.

Figure 2.4.1 File Management Page

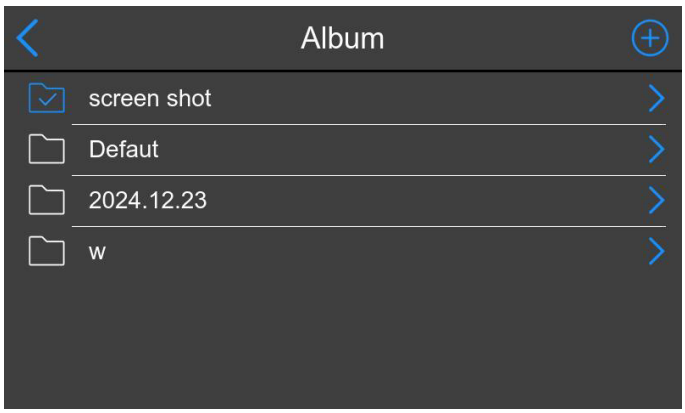


Figure 2.4.2 New Folder

2.4.1 New Folder create

The camera supports creating different file save directories.

Users can create new albums to pre-classify the inspection locations based on tasks or schedules, making it easier for users to manage and operate.

Figure 2.4.3 Set as storage path

After entering the file management section on the main interface, users can create a new album by clicking the plus icon in the top right corner, it also supports set as any storage path.

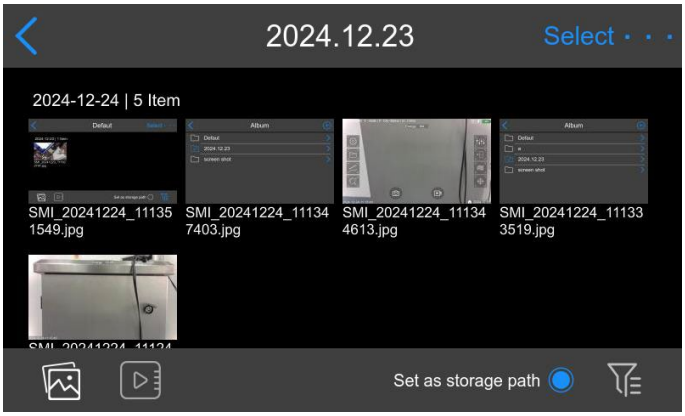


Figure 2.4.4 et as storage path

Enter the file management page, the camera supports search by date.

2.4.2 Note Function

Camera supports photo note function, The device supports photo comment function, i.e., after taking photos of leakage and local release, the device supports the user to take auxiliary photos for content comment, such as the location information of the monitored equipment.

Select the photo and click the screen, the camera shows photo comment , text comment , upload to cloud , export and delete icons.

Users can click the Start Button and the End Button to select the dates of the file.

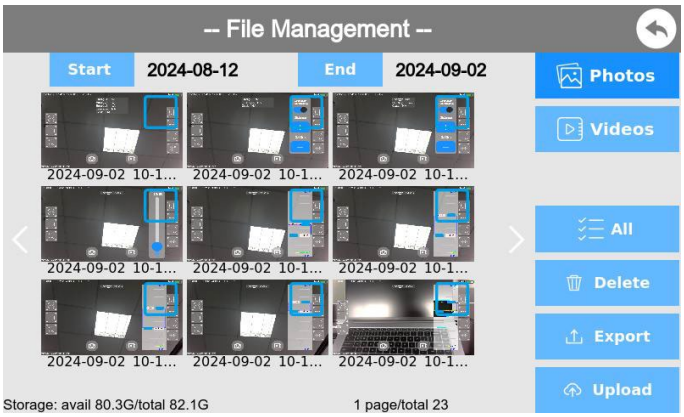


Figure 2.4.5 Main Page

After opening a photo, user can click the icon in the upper left corner of the photo to view information such as the time, frequency band, energy, and location of the photo.

Photo Annotation：

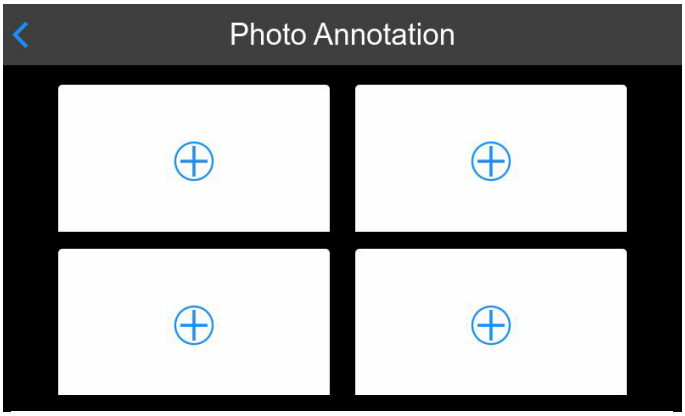


Figure 2.4.6 Photo Annotation

Users can add up to 4 photos as notes on a single image

Text Annotation：

Users can add or modify the text annotation with this function.

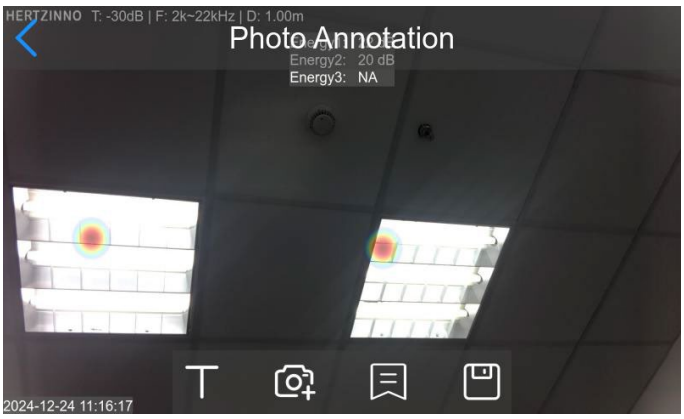


Figure 2.4.7 Text Annotation

Video management

Users can click the video button to view all the videos, and the device supports video playback function.

File Export

The device supports single photo export as well as multiple photo and video combination export.

Users can choose one or more photos to export according to the actual needs, The export interface will remind you to export photos or data files.

If you choose to export only photos and videos, then the content of the device exported will only be photos and videos, these photos and videos can not be analysis by software.

Exporting a file means exporting a file with relevant acoustic data, which can be recognized by offline

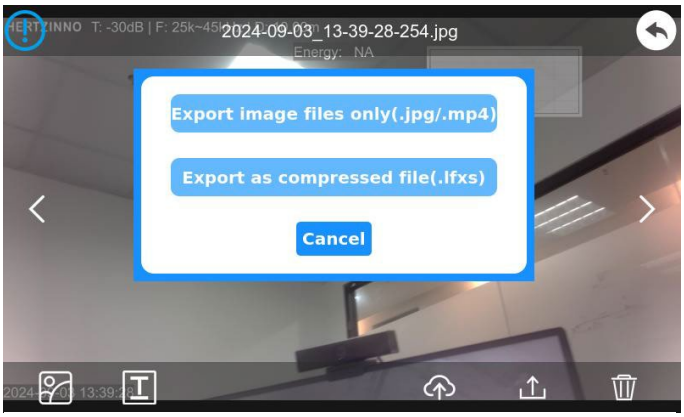


Figure 2.4.8 Export file remind

analysis software and support further data analysis functions and export reports.

Upload

Users can upload the photo to cloud, if the camera enables cloud function.

(Please contact your local dealer about this service)

3. Operating Instructions

3.1 Partial Discharge Detection

3.1.1 PRPD Mode

Switch to PD mode.

Please refer to 2.6.6.1 Imaging Mode Setting.

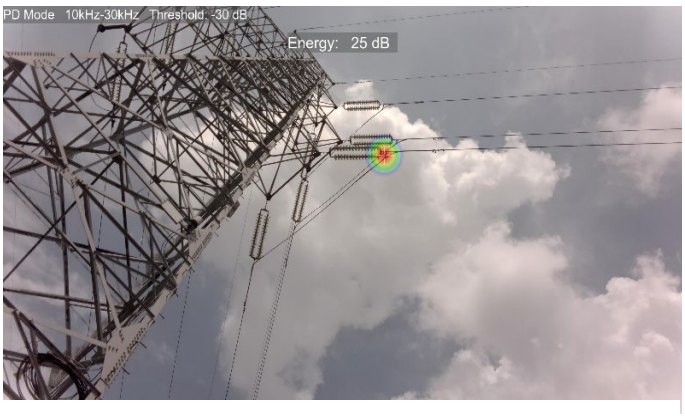


Figure 3.1.1 Partial discharge detection

Point the camera to the equipment to be monitored.

It is recommended to adjust the sound threshold value according to the on-site environment so that the threshold value is lower than the on-site energy value.

The sound field appears on the screen. If there is only one anchor point on the sound field map, and the actual position corresponding to the anchor point does not change significantly and is relatively stable when the camera is rotated and observed from different angles, then this position is the partial discharge position.

In the partial discharge detection mode, click the PRPD map  button to draw the PRPD plot of the PD position in real time, and user can judge the partial discharge type according to the map.

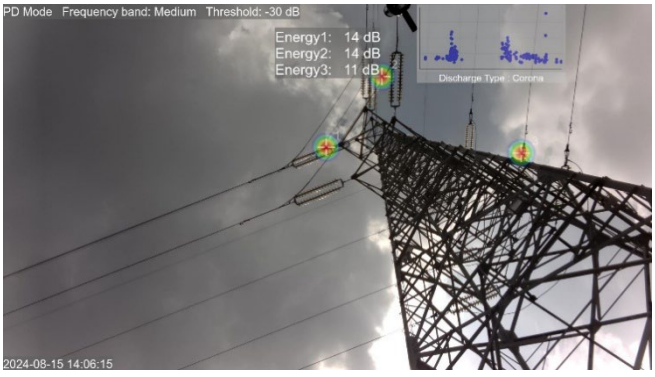


Figure 3.1.2 PRPD Function

When PRPD Function enabled, the camera will show an image of PRPD result on the screen.

Figure 3.1.3 PRPD Function with large image

Click the PRPD image, user can get a larger image.

1. Click the camera icon at the bottom of the screen to quickly take a picture and enter the file management to view the details of the photo.
2. Click the video icon at the bottom of the screen to start recording. The recording time will be displayed on the top of the screen.
3. Click the video icon again to end the recording.
4. Enter the file management to view the photos and videos taken.

3.1.2 PRPD Parameters

In PD mode, our devices support different frequency (50/60/16.7Hz) and partial discharge prediction functions.

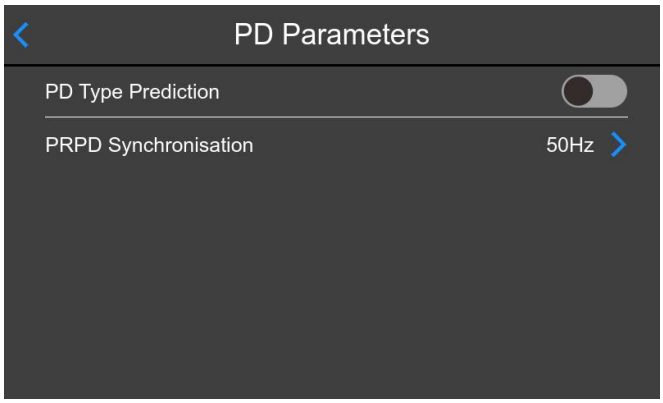


Figure 3.1.2.1 PD Parameters Setting

When the PD type prediction function is enabled, the device will display the PRPD type results in real time on the main interface.

3.2 Leakage Detection

Switch to Gas Leakage mode. Please refer to 2.6.6.1 Mode Setting. change the imaging mode to leak mode.

In the leakage detection mode, click the leakage estimation button to enable the leakage calculation function, set the current distance from the leakage point, and then calculate the leakage value of the leakage point.

Enable leakage calculation button, and select the distance, and then the user can get the result.

In the leak parameters page, user can set the price of gas, energy, working hours.

Figure 3.2.1 Gas leak detect mode

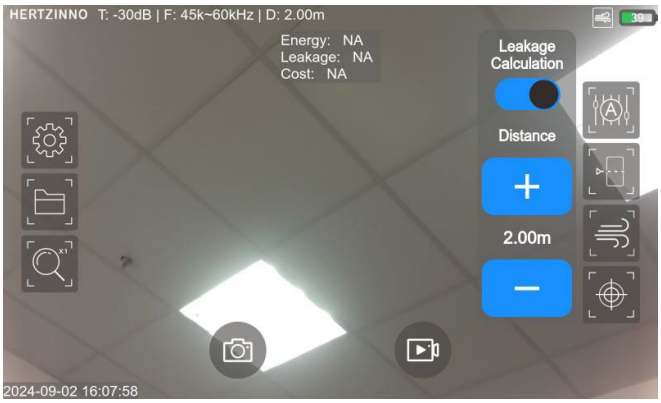


Figure 3.2.2 Leakage calculation

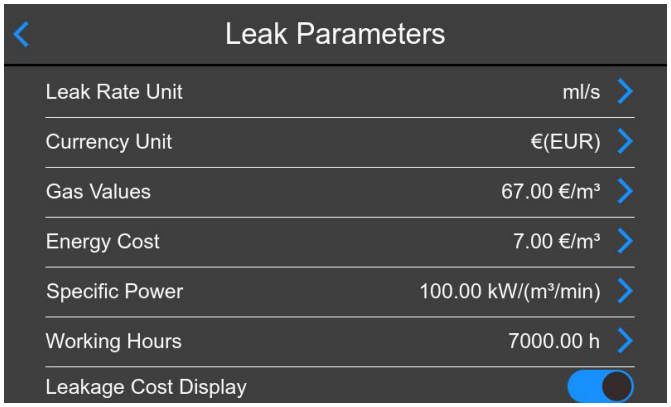


Figure 3.2.3 Leak Parameters

3.3 Mechanical fault Detection

Constant wear and tear on key components of conveyor systems, such as belt

Figure 3.3.1 Mechanical Noise fault Detection

conveyors, can lead to degraded performance.

Bearings that require lubrication or are failing can emit excessive noise and abnormal audio messages.

Cameras can detect bearings that are making more noise than other bearings in the vicinity, providing an accurate, non-contact method of identifying bearings that may be in poor condition.

To help identify faulty bearings, the camera provides four metrics: Sound Energy (SPL), Crest Factor, Spectral Difference between the front and back frames, and Kurtosis.

Sound Energy:

Sound energy is a result of the strength of a sound, it also be called SPL(sound pressure level), when the rollers are in bad condition, the sound energy will be higher than the normal part.

Crest Factor:

The crest factor is the ratio of the peak amplitude to the root means square value of the signal.

The crest factor of a healthy bearing sound signal is usually around 5. A Crest Factor of 6 or more indicates that the bearing may need lubrication or is beginning to fail.

As the failure progresses further, the Crest Factor increases, but after a certain point it may start to decrease. This means that if the bearing shows a high sound pressure level compared to a healthy bearing, but a relatively low Crest Factor, the bearing may be in very serious condition.

Kurtosis:

Kurtosis is a result of the distribution of samples in a sound signal, the camera shows the excessive result, when the result is 0, meaning that the system is in a healthy condition. A kurtosis is approximately 2 or higher, it indicates that the condition is getting worse.

Spectrum Variance:

is the spectral difference between the front and back frames, if the data is more than 50% it means the device is not rotating evenly

3.4 Thermal Imaging (Optional)

Switch the camera to thermal imaging mode.

The camera supports multiple emissivity options, detection area selection, pseudo-color mode selection, and temperature alarm settings.

3.4.1 Emissivity function

Figure 3.4.1.1 Emissivity options

Temperature measurement

User can use different tools to set the measurement area.

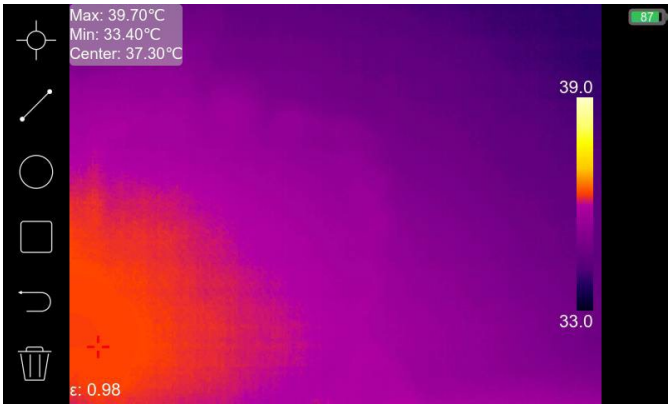


Figure 3.4.1.2 Temperature Measurement

3.4.2 Pseudo-Color Select function.

User can select different pseudo-color.

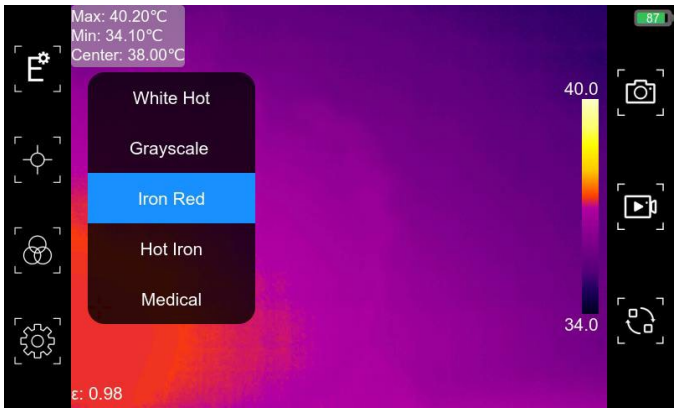


Figure 3.4.2.1 Pseudo-color select

3.4.3 Thermal parameters settings

Users can select different temperature measurement range, Temperature unit, Alarm set, and other functions.

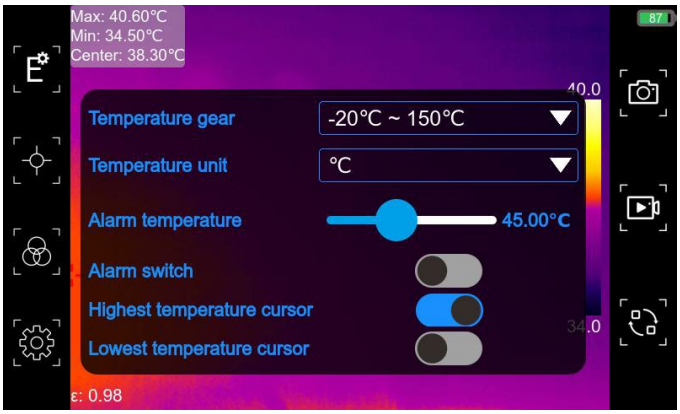


Figure 3.3.4 system settings

4. Q&A

Q: Why is the sound field positioning unstable?
A: It may be that the frequency band is not set correctly, and the imaging frequency band setting does not match with the ultrasonic frequency band of gas leakage/partial discharge, this would result in incorrect positioning and unfocused sound field.
Please modify the frequency band.

Q: Why are there 3 sound field points for single target positioning?
A: It may be caused by reflection when the strength of the reflected signal is equal to that of the direct signal.
User can rotate the device to different angles to remove the reflected signal.

Q: Why can't the infrared mode be turned on?
A: Please check whether the device is equipped with an infrared camera.
Only the HA-271P is equipped with an infrared camera. In addition, the battery may be insufficient, resulting in the infrared cannot be turned on normally. Please try again after charging the battery.

Q: Why can’t the U disk be recognized
A: The format of the U disk should be FAT32, please confirm whether the format of the U disk is correct. You can also try another USB flash drive.

Q: Why is there no sound field positioning point?
A: It may be because the threshold is set too high. Try again after adjusting the threshold lower than the current energy value.