

Sorama CAM iV64s

User Manual



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MICROWATT

*UNDER PROMISE,
OVER DELIVER.*

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CONFORMITY

Sorama B.V.
Achtseweg Zuid 153H
5651 GW Eindhoven
The Netherlands

This document is subject to change without notice.

Declare under our sole responsibility that the product:

Product name	Acoustic Camera
Model number	Sorama CAM iV64s

is in conformity with the requirements of the following EU Directive or other normative documents. This declaration is based on the products' full compliance with the following European standards:

- General Safety
 - IEC 61010-1
- For Electromagnetic compatibility directive (EMC)
 - EN 301 489-17 V3.2.4 referring to EN 301 489-1 V2.2.3
 - EN 55032:2015 Class B
 - EN 61000-4-3:2006
 - EN 61000-4-2:2009
- RoHS3 Restriction of Hazardous Substances
 - EU2011/65/EU RoHS2
 - EU2015/863

Technical Compliance Data held by:

Sorama B.V.
Achtseweg Zuid 153H
5651 GW Eindhoven, NL

<https://www.sorama.eu/>
info@sorama.eu

Signed for and on behalf of Sorama B.V.

Address: Achtseweg Zuid 153H, 5651 GW, Eindhoven

WARRANTY INFORMATION

The Sorama CAM iV64s is covered by warranty repair service for abnormality or malfunctions caused by product quality issues within one year from the date of purchase. The warranty repair service excludes issues resulting from improper use or accidental damage, such as drops. Unauthorized disassembly of the product will void the warranty. In case of malfunctions caused by improper use or accidental damage, Sorama offers repair services. The device is calibrated during the manufacturing process.

Sorama disclaims all liability for any accident, injury or property damage resulting from the use of product in an improper manner or in an unsafe location. Failure to comply with the safety information, especially tampering with the casing, will invalidate the warranty.

SAFETY INFORMATION

This document contains important information that should always be available to the operator(s) of the product during its operational life. Eventual updates to this digital manual will be added regularly. It is therefore always advised to consult the latest available version of the manual which can be found on the Sorama website. The revision number and date can be found on the first page of this document. The product can only be operated in accordance with these instructions and local safety regulations.

This product is intended only for the measurement of sound. The product operates reliably in demanding conditions as described in the manual. Compliance with the operating instructions is necessary to ensure the expected results.

Physical Damage

If any physical damage occurs to the device and there is visible damage, do not use the device anymore and remove the battery. Specify the damage details and contact Sorama for further support to assess the damage severity.

Replacement Parts and Accessories

Use only original parts and accessories approved by the manufacturer. The use of other products can compromise the operational safety and functionality of the product.

To prevent possible electrical shock, fire, or personal injury, please follow the guidelines given below:

Product-specific

- Read all safety information before you use the product.
- Do not open or try to repair the unit yourself.
- Use the product only as specified to ensure the protection it provides is not compromised.
- Do not use the product around explosive gases, vapor, or in damp or wet environments.
- Do not use and disable the product if it is damaged.
- Do not use the product if it operates incorrectly.
- When any maintenance needs to be done to the unit, it needs to be sent back to Sorama.
- Maintenance or other servicing to the device can only be performed by trained personnel assigned by Sorama.

Battery-specific

- Do not disassemble or crush battery cells and battery packs.
- Batteries contain hazardous chemicals that can cause burns or explode. If exposure to chemicals occurs, clean with water and get medical aid.
- Contact Sorama when the battery leaks.
- Remove the batteries if the product is not used for an extended period or if stored in temperatures above 35°C (95°F). product . The product can be damaged If the batteries are not removed.
- Use only Sorama approved power adapters to charge the battery.
- Do not store cells or batteries in a container where the terminals could short-circuit.
- Do not short-circuit the battery terminals together.
- Do not put battery cells and battery packs near heat or fire. Do not put in sunlight.
- Disconnect the battery charger and move the product or battery to a cool, non-flammable location if the rechargeable battery becomes hot ($\geq 50^{\circ}\text{C}/122^{\circ}\text{F}$) during the charging period.
- Additional batteries can only be supplied by Sorama.

BATTERY

Specifications:

Model	RRC2057 (2S2P)
Type	Lithium Ion
Voltage	7.20V
Capacity	6.90Ah
Max. charge current	4.83A
Max. charge voltage	8.40V
Max. discharge current	9.50A
Dimensions (L x W x H)	85.35 x 77.65 x 23.0 mm
Weight	230g

Warning

To prevent personal injury and for the safe operation of the product:

- Do not put battery cells and battery packs near heat or fire.
- Do not put in sunlight.
- Do not disassemble or crush battery cells and battery packs.
- Remove batteries to prevent battery leakage and damage to the product if it is not used for an extended period.
- Connect the battery charger to the main power outlet before charging.
- Use only the power adapters approved by Sorama to charge the battery.
- Keep cells and battery packs clean and dry. Clean dirty connectors with a dry, clean cloth.

Caution

To prevent damage to the battery:

- Do not expose the battery to heat sources or high-temperature environments such as an unattended vehicle in the sun.
- Do not store the battery on the charger for more than 24 hours, as reduced battery life may result.
- Charge the battery for a two-hour minimum every six-months for maximum battery life. Without use, the battery will self-discharge in approximately six months.
- Always operate in the specified temperature range.
- Do not incinerate the product and/or battery.

A Li-ion battery powers the Acoustic Camera. The Acoustic Camera includes two batteries for a quick change during operation.

The battery charges on a single-bay charging base. The power supply powers the charging base. Country-specific adapters are included.

The battery is successfully tested and complies with:

- UN Model regulations, Manual of Tests and Criteria Part III Subsection 38.3
- FCC part 15
- UL2054/UL60950-1
- IEC62133
- RoHS
- CE

And has been manufactured under a quality management program as specified in 2.9.4 of the UN Model regulations.

Symbols:

Symbol	Description
	The product has been assessed by the manufacturer and complies with EU safety, health and environmental protection requirements.
	Certifies that the electromagnetic interference from the product is under the limits approved by the Federal Communications Commission.
	Dispose of this product according to local Regulations. Do not dispose of this product as unsorted municipal waste.
	Cautionary notice!
	Consult accompanying documents.

To change the batteries from Sorama CAM iV64s:

- Click the battery cover lock and slide open the battery cover.
- Pull the battery out from the compartment.
- Replace it with a charged battery.
- Close the battery cover.

DESCRIPTION

The Sorama CAM iV64s is a state-of-the-art acoustic camera that displays highly accurate sound levels and localizes sound sources on its 7-inch touch display, specifically designed for users who require mobility and instant, reliable acoustic information to perform in-field measurements.

Features

- Real-time spectrum analysis
- Far-field sound source localization and visualization
- Generation of reports using the Sorama Portal
- Leak Inspection
- Partial Discharge Inspection
- Mechanical Inspection

Technical data

1.1. Physical properties

Size	170 x 350 x 157 mm	L x W x D
	6.7 x 13.8 x 6.2 inch	
Weight	2.8 kg	Including battery
	6.2 lb	
Connectivity	USB-C and Wireless	USB 3.0 and dual-band 2x2 802.11ac WLAN
		(Only available in some regions)
Battery	Rechargeable battery	Battery life $\pm$ 4 hours
Hardware connections	1/4" screw connection	Tripod mountable
		(Only outside the hazardous zone)

1.2. Storage

Internal	500 GB
Storage formats	The Sorama File Format EX (.sorX file) is compatible with Sorama Portal for report generation.

1.3. Display camera

Touch display	7-inch LCD capacitive touchscreen
Display resolution	720p
Camera Resolution	720p

1.4. Acoustics

SNR (A-weighted, at 1 kHz)	66 dB per channel	At 1 kHz, 94dB SPL
Sensitivity	-37 dB FS +/- 1 dB FS	At 1 kHz, 94 dB SPL
Acoustic overload point	132.5 dB SPL	At 1 kHz, <10% THD
Auto min/max	Auto or manual, user-selectable	

1.5. Measurement features

Sampling rate	240 kHz (max)	
Frequency resolution	29 Hz	
Operating distance	0.3m to 120m	
Spectrum analysis	29 Hz – 120 kHz	
Beamforming (far-field)	500 Hz – 120 kHz	Streaming + recording

Environment

1.6. Ambient temperature

The Sorama CAM iv64s operates in ambient temperatures ranging from -20°C to 50°C (-4°F to 122°F). Note that water can cause condensation, which can lead to damage in the device. The ambient operating relative humidity is between 10-90% RH (non-condensing).

Protection

Warning

The AOP (Acoustic Overload Point) of the microphones is 132 dB. A user could potentially damage the microphones if the microphones are subjected to sound sources higher than the AOP.

Warning

The USB-C connector port is not used for charging, and it is solely used for data communication.

Any water entering the MEMS microphones may cause the device to show incorrect measurement output values. Water entering the holes of the microphones should always be avoided. In case water was in contact with the microphones, place the sensor head such that any water can drip out from the microphone holes and let it dry in this position.

GETTING STARTED

List of items



The following items are included with the product:

Number	Description	Quantity
1	External Battery Charger	1
2	Rechargeable Lithium-ion Battery Pack	2
3	Country-Specific Adapters for Battery Charger	1
4	USB-C to USB-A Cable (1.5m)	1
5	Sorama CAM iV64s Acoustic Camera	1
6	Protective Case	1
7	Accessory Bag	1
8	Shoulder Strap	1
9	Hand Strap	1

Hardware features and configuration



Number	Description
1	LED Indicator
2	USB-C Connector
3	Touchscreen Display
4	Shoulder Strap Anchor
5	Battery Compartment / Tripod Connector
6	Acoustic Sensor / Webcam
7	Power on / Measurement Trigger Button / Force Shut Down
8	Hand Strap Anchor and Screw Point

Warning

The USB-C connector port is not used for charging, and it is solely used for data communication.

Installing the Strap

Device comes with 2 straps, namely “Shoulder Strap” and “Hand Strap”. Both can be installed in the way shown below:

Shoulder Strap: Put the short end of shoulder strap within Shoulder Strap Anchor, and roll the strap around the plastic hook. Then attach the longer part of the strap with the metal hook. Visual representation of the steps is given below, going from left to right.



Hand Strap: Put the hand strap to the Hand strap anchor and screw point, and turn the screw to tighten the strap. Then use the slots on below to put the other end of strap through the slots, and attach it. Visual representation of the steps is given below, going from left to right.



Power up and LED indicator

Press the trigger button on the pistol grip to power up the device. The LED above the USB-C connector will indicate that the device is turned on.

The Sorama CAM iV64s currently has 3 LED colors. The table below explains the meaning of each color.

LED Color	Description
Red	The device is booting
Green	The device is fully booted, and the default user interface is running
Blue	The device is still switched ON, but the application is not running anymore

Power off

To turn off the device, press the trigger button for 2 seconds.

When a hard reset is needed for the device, press the trigger button for 5 seconds.

Home screen

When the device is fully booted, the home screen contains several icons. The meaning of the icons is as follows:

Symbol	Description
	Battery level
	Storage space is less than 1 GB
	Recording disabled, memory full
	Wi-Fi connection

Good to know / background info

- **Sound Pressure Level**

The sound is defined as pressure variations in the air, which is generally quantified by the sound pressure. Sound Pressure Level (SPL) is a weighted sum of the frequency components of acoustic signals. SPL is expressed in decibels (dB SPL).
- **SoundSurface**

A SoundSurface is a visualization of the SPL values for the area that being investigated. It shows where sound is originating from. Often times it is overlayed on the camera feed to allow linking a sound source to a visual location.
- **Frequency Spectrum**

Frequency Spectrum is the distribution of the amplitudes (dB SPL) of each frequency component against frequency (Hz). In other words: The signal consists of different frequency components which all contribute to the sound.
- **Field of View (FOV)**

Horizontal/Vertical observation angels of the webcam.
Horizontal FOV 53° and Vertical FOV 36°.
- **Beamforming**

A signal processing technique used to identify the location of sound by using an array of microphones. The localization of sound is determined by the difference in time at which sound reaches the microphones in the array.
- **Frequency band selection**

Frequency band selection acts like a window, focusing on the selected frequency range in the spectrum. The frequency ranges of the sound other than the selection are filtered out and not visible on the display.
- **Partial discharge**

Partial discharge is an electrical discharge that does not completely bridge the space between two conducting electrodes.
- **External Discharge**

It refers to the phenomenon where electrical current escapes or flows outside of a confined or intended path, often due to insulation breakdown, leading to arcing, sparking, or other unintended conductive paths in electrical systems.
- **Internal Discharge**

This is most often caused by a defect in the solid insulation of cables, bushings, junction insulation, and such. Void discharge is highly destructive to insulation and will typically continue to expand until they cause complete failure.
- **Surface Tracking**

When discharge travels along the surface of insulation, this is called surface discharge or surface tracking.
- **PRPD Plot (Phase Resolved Partial Discharge)**

The PRPD plot shows the amplitude of each discharge event (vertical axis) plotted against their phase angle (horizontal axis).
- **Gas Leaks**

It refers to a leak of natural gas or another gaseous product from a pipeline or other containment into any area where the gas should not be present.
- **Hose Leakage**

A hose is a flexible tube that allows easy tubing. However, as opposed to the metal and brass pipe, it is a more sensitive material. Therefore, specific cuts and holes are easily formed along with the hoses that connect an air compressor to pneumatic devices, resulting in leakages.
- **Open-End Leakage**

It is a leak that occurs when a tubing/piping section of the compressed air system is left open.

- **Quick-Connect Leakage**

This type of leakage occurs in quick-connect fittings, which are also known as quick-disconnect or quick release couplings. Due to the damages in inner tilts, the compressed air/gases leaks through the quick-connect fitting.

- **Threaded Coupling Leakage**

These leakages occurs due to loose sections on the threaded end caps, that are used for a compressed air system's endpoint. These end caps can also deform, which also can lead to the air/gas leakages.

- **PF Curve**

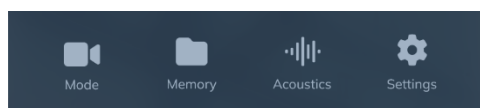
A PF (Prevention Failure) curve is a graph used to identify asset reliability and performance over time. It plots the interval between an asset's potential failure (P) and functional failure (F), which allows to identify when preventive maintenance measures should be taken.

- **Cavitation**

Cavitation is the formation and collapse of vapor-filled bubbles in a liquid, typically due to rapid changes in pressure. This phenomenon usually occurs in liquids when they are subjected to low pressures or high velocities.

MENU

To reveal the menu, swipe down from the top. The following menu is shown.



The user can easily gain access to the different features and settings of the device. The required feature or setting can be selected by touching the related icon on the screen. When the icon is selected it will turn white.

The following features and settings are included:

	Mode	This is the menu showing the various modes the device can use. These modes are namely: Image, Video, Partial Discharge Inspection, Leak Inspection, and Mechanical Inspection.
	Memory	This is the menu showing the saved measurements and enables to transfer, rename and/or delete measurements.
	Acoustics	In these menus, you can adjust the acoustic settings of the device.
	Settings	In this menu, the general settings of the device can be viewed and/or adjusted.

Mode

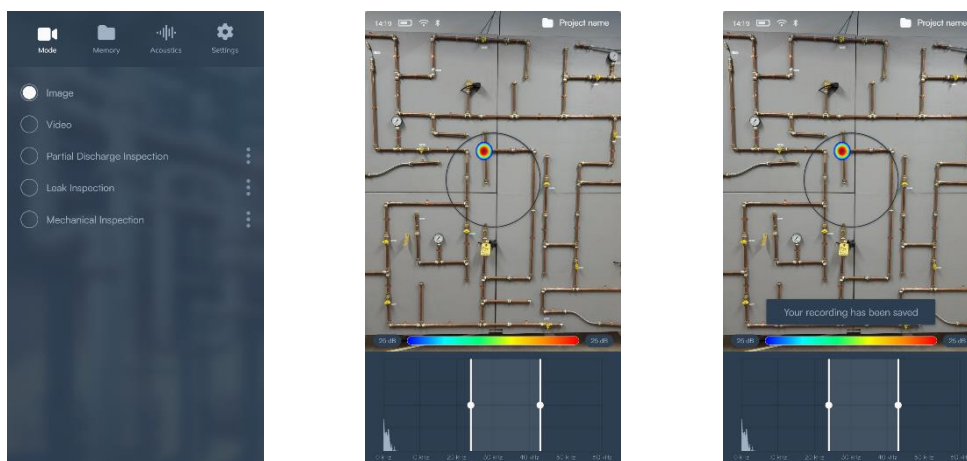
By tapping on the “Mode” icon in the navigation menu, the user will be presented a menu, with options based on the licenses the device has:

- Image
- Video
- Partial Discharge Inspection
- Leak Inspection
- Mechanical Inspection

Image and video are basic functionalities of the device, while partial discharge inspection, leak inspection and mechanical inspection are extra features and require specific packages. For licensing information, see Section “Feature Licensing”.

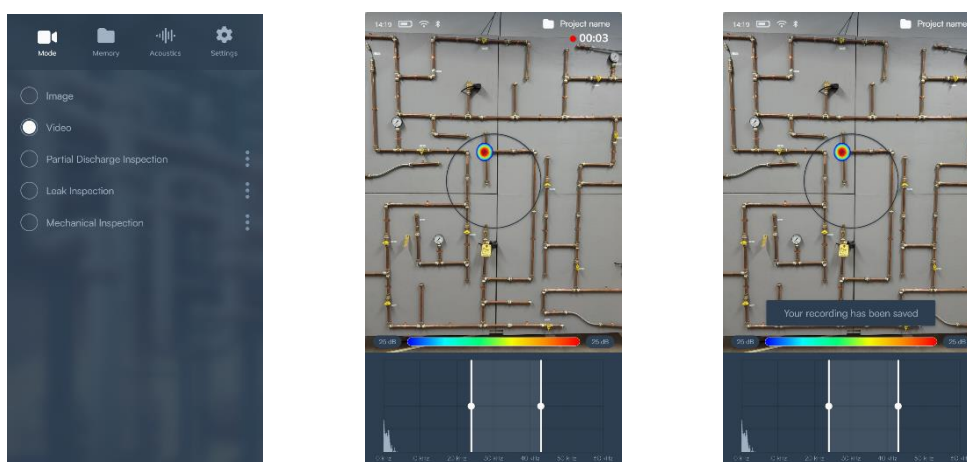
1.7. Image

By choosing the “Image” option, user can take screenshots, by clicking on the pistol grip button. After the image is taken, the screen will show the following message, “Your recording has been saved”. The image output will be in .jpeg format. The process flow is shown in the above screenshots.



1.8. Video

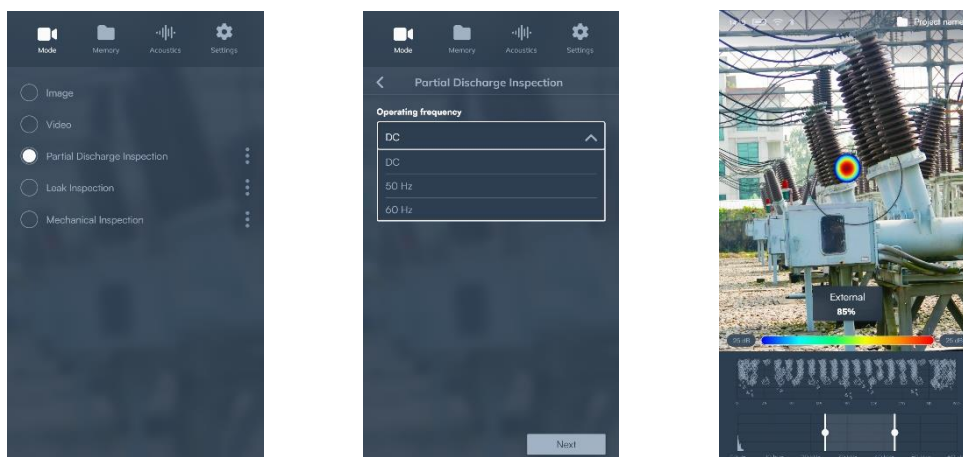
By choosing “Video” option, the user can create video recordings, by clicking once on the pistol grip button to start the measurement and second time to stop it. After the image is taken, the screen will show the following message: “Your recording has been saved”. The video output will be in .mp4 format. The process flow is shown the screenshots above.



1.9. Partial Discharge Inspection

This mode is used to detect partial discharge, i.e., identifying defects in High Voltage (HV) assets. Defects can include voids, gaps, splits, physical sharp points, imperfections or discharges in the open air on/within HV assets. The defect itself discharges as it is not able to insulate the voltage applied across it.

By clicking on the 3 dots menu  adjacent to the option, user can select the operating frequency as per the application. The options are: DC, 50Hz and 60Hz. The screens will be as shown below.



For measuring the PD, place the camera towards the expected PD source at a distance as close as possible considering the practical restrictions. The expected source should be placed within the circle shown on the screen. Select the spectrum band in the region from 35kHz to 40kHz and press the trigger. This will start the measurement and the processing bar will show the measurement status. After the processing bar reaches 100%, the resulting PRPD plot and spectrum will be shown on the screen along with the discharge type in form of percentage. The three discharge types that are supported on device are “External”, “Internal” and “Tracking”. For more information on these types, please see Section “Good to know / background info”.

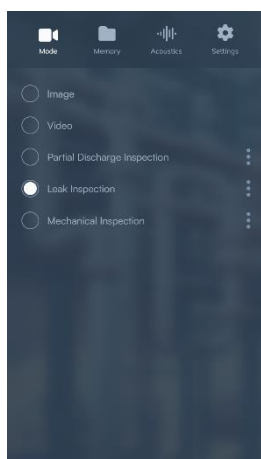
1.10. Leak Inspection

This mode is used to quantize compressed air/gas leaks. On-device leak inspection can be used to determine a type of leak in a pressurized system and estimate the leak’s size. This capture mode is always subjected to environmental conditions. Depending on these conditions (distance, environmental noise), values such as leak rate should be seen as indicative. Estimated minimum flow based on distance and noise in the environment from field-testing:

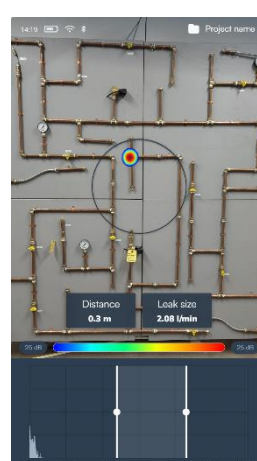
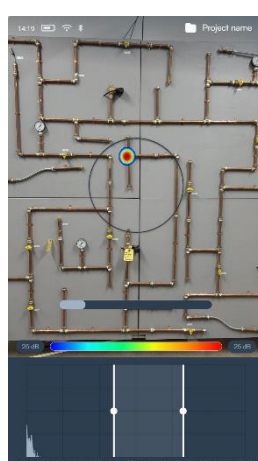
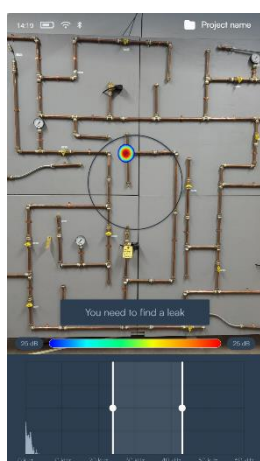
Quiet environment	0.3m to 5m	0.02l/min to 0.1l/min
	5m to 10m	0.1l/min to 0.2l/min
Noisy environment	0.3m to 5m	0.05l/min to 0.15l/min
	5m to 10m	0.15l/min to 0.3l/min

By clicking the 3 dots menu , adjacent to the option, the user will reach a dashboard, which contains the options:

- Unit System: Select the unit system, choosing between Imperial or Metric
- Pressure: Enter the pressure of the system.
- Gas Cost: Enter the cost of the gas. Leave the cost equal to zero, if it is air.
- Electricity Cost: Enter your cost of electricity per kilowatt-hour (kWh).
- Power Ratio: Enter the system-specific power ratio (kW per CFM or kW per 100l/min). The specific power at a certain pressure is a value typically indicated on compressor data sheets.
- Operating Hours: Number of hours the system operates a year (e.g. 8760 for plants operating 24/7 all year long).

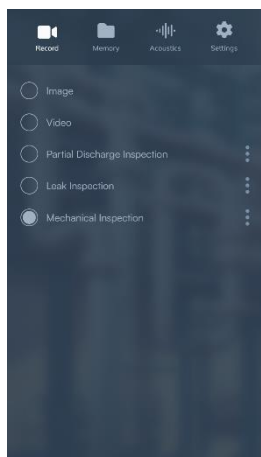


For measuring the leak, place the camera towards the expected leak source at a distance as close as possible considering the practical restrictions. The expected source should be placed within the circle shown on the screen. Select the spectrum band in the region from 30kHz to 40kHz and press the trigger. This will start the measurement, and the processing bar will show the measurement status. After the processing bar reaches 100%, the estimated results in form of Distance and Leak Rate will be shown on the screen. The screenshots for the above process are shown below in steps.



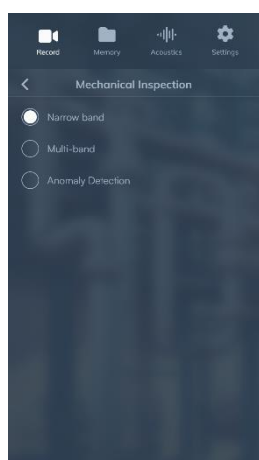
1.11. Mechanical Inspection

This feature can be used to inspect the rotating mechanical components and study their behaviour. By clicking on the 3 dots menu , the different modes of operation can be found. These are namely: Narrow Band, Multi-band and Anomaly Detection. These modes are explained below.



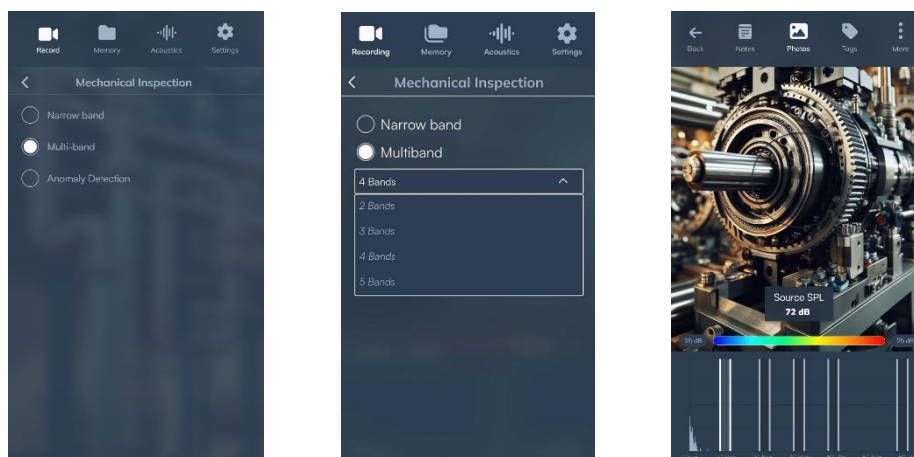
1.11.1. Narrow Band

This mode is recommended to start with. To use this mode, aim the circle on the screen at the component you would like to inspect.



Move the block on the spectrum, starting from high frequency range and slowly moving downwards towards the low frequency. While doing that, see if there is a blob appearing on the component you are inspecting. This might be an indication of early failure as per the PF curve. On the screen, the SPL of sound at the source is shown.

1.11.2. Multi-band

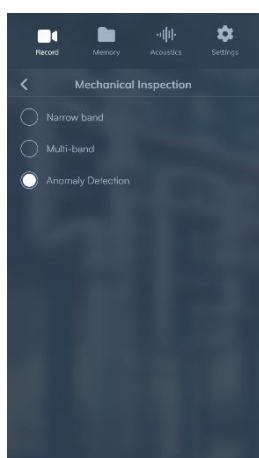


This is a second recommended feature, after starting from a narrow band. When selecting the multiband option, you get to select the amount of bands. After selecting a number of bands, in each option, the lowest frequency band can be moved manually, while other accompanying bands will automatically move along in a pre-defined pattern.

The user can start the measurements by selecting 5 bands, and check for a location of a blob on the asset. Start by moving the band at the highest possible frequency range first, and slowly move downwards towards the low frequency. When a blob is found, press the trigger, and record the output shown on the screen.

1.11.3. Anomaly Detection

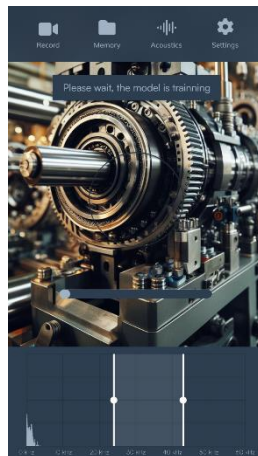
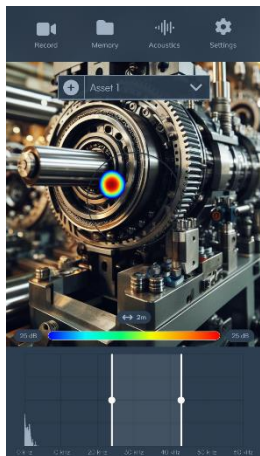
This mode uses machine learning algorithms to find anomalies within the components under inspection. The mode can be selected by tapping "Anomaly Detection" in the menu.



Train Mode:

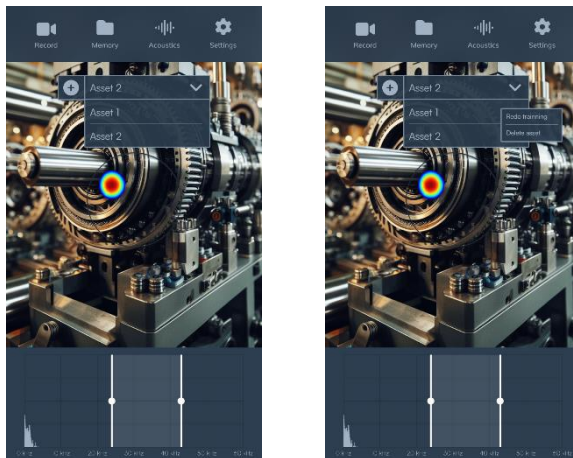


The training procedure can be started by tapping the “+” symbol. It will ask you to supply a model name. As the model name is entered, press “Enter” and your device is now ready to start training. Keep the device still and press the trigger button to start training the model. The status bar on the screen will show the progress during the training of the model. A message saying “Training Complete” will show up on the screen when training is done. The screenshots for the process are shown below:



More assets can be added using the same “+” button.

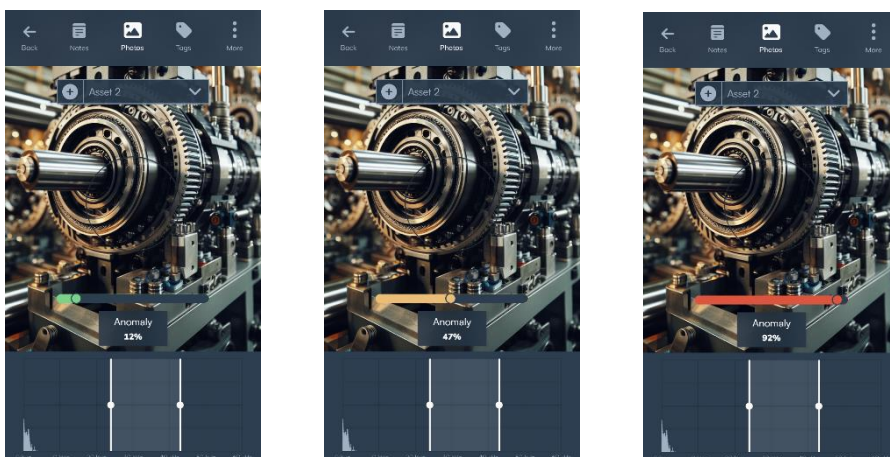
Measurement Mode: The models trained are shown in the dropdown menu, as shown below:



These models can be selected to test the asset. Models can also be retrained and deleted by pressing the respective model in the dropdown menu for a few seconds, and clicking on the corresponding option. After the model is selected, the measurement trigger button can be pressed to start studying the behavior of the asset. The progress bar will be shown on the screen showing the status of the measurement, as shown below.



The result will be shown in the form of percentage of anomaly. This percentage is shown on the status bar along with the color scaling, varying from green to red for 0 to 100% respectively. Three score examples are shown in the screenshots below:



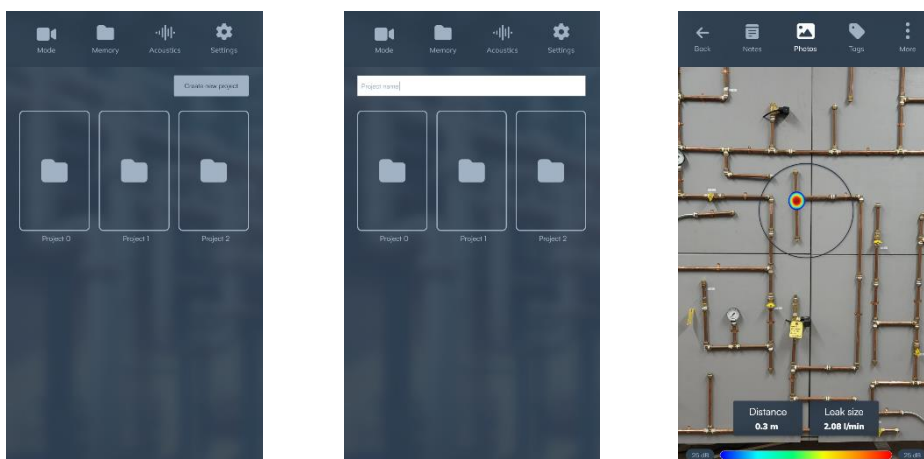
Memory

The user can view all the saved measurements and transfer, rename and/or delete measurements in the device storage.

Tap  to access the file storage.

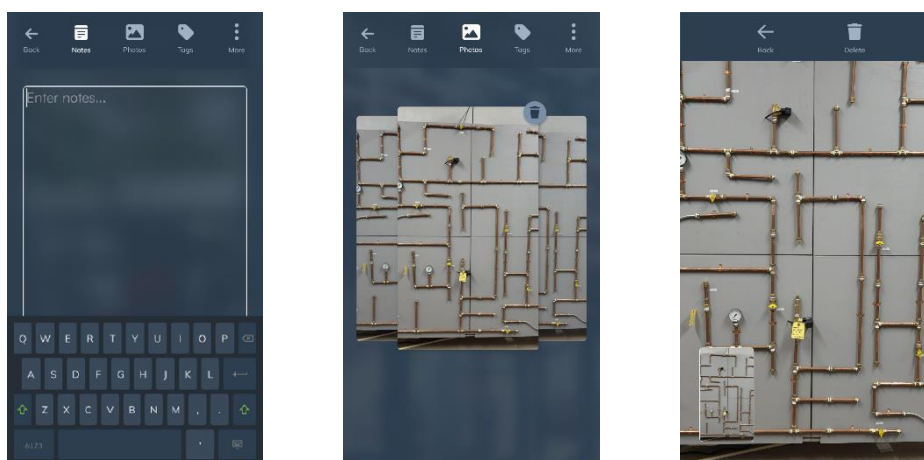
The “default” folder is automatically created and all the measurements are saved in this, until specified explicitly.

Folders: The new folders can be created by using the option “New Project”. The name of the folder can be entered and the folder will be created and will act as active folder. To change the location of measurements that are being saved using ‘Mode’, press and hold the required folder for a few seconds and then use the Activate option to activate the folder. The activated folder is also shown in the highlighted white logo color.



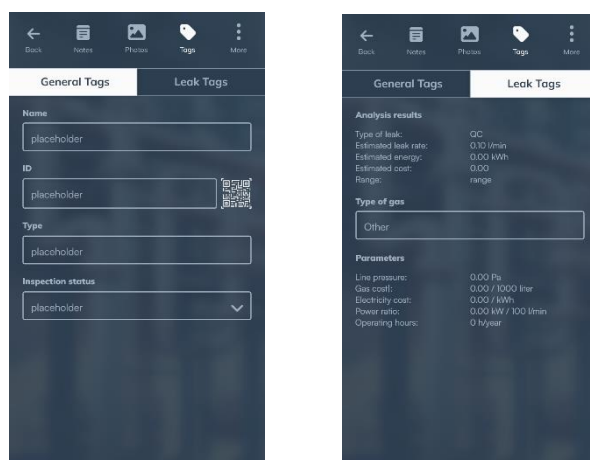
Access to Measurements: To access the measurements, the folder can be selected and the folder content is shown. From this, the required file can be accessed. Additionally, the corresponding information can be added to the file in the form of notes, images and tags. These can be accessed via the icons displayed on the screen below:

“**Notes**” can be used to document specific information about the measurement. “**Photos**” can be used to add supporting images of the asset, like position or any other visual representation of the asset that the user might need afterwards. The images can be added using the “+” sign on the screen. “**Tags**” can be used to enter more specific and supporting information about the assets such as Name, ID, type and inspection status. Inspection status can be further recorded in form of Undetermined, Asset Status as Found, and Asset Status as Left.



Additionally, “**Tags**” might also contain the specific information for specific measurement types.

For the Leak Inspection module, it displays the analysis results, as calculated by the parameters entered during the measurement. For more information on parameters, refer to Section 1.10. The results contains: type of leak, estimated leak rate, estimated energy and estimated cost. For more information on types of leaks, please refer to Section “Good to know / background info”.



General Tags | **Leak Tags**

Name: placeholder

ID: placeholder

Type: placeholder

Inspection status: placeholder

Analysis results

Type of leak: GC

Estimated leak rate: 0.10 l/min

Estimated energy: 0.00 kWh

Estimated cost: 0.00

Range: range

Type of gas

Other

Parameters

Line pressure: 0.00 Pa

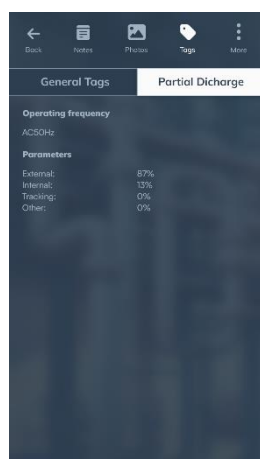
Gas cost: 0.00 / 1000 liter

Electricity cost: 0.00 / kWh

Power ratio: 0.00 kW / 100 l/min

Operating hours: 0 h/year

For PDD module, it displays the results in form of Operating frequency that was selected during the measurement and the classification of Leak type. The screens for the following are shown below:



General Tags | **Partial Discharge**

Operating frequency

ACSOHz

Parameters

External: 87%

Internal: 13%

Tracking: 0%

Other: 0%

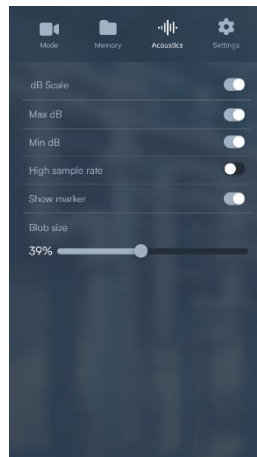
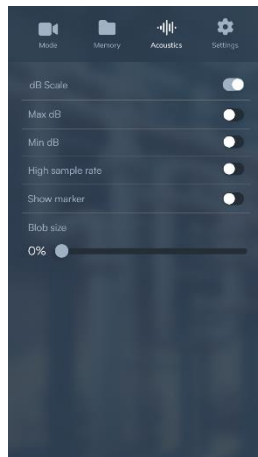
“More” button include 2 options, “Send Report” and “Delete”. “Send Report”, will send the above reports to the specific email address, being asked in the next step, after selecting the option. “Delete” option can be used to delete the specific measurement.

Acoustics



Tap **Acoustics** to adjust the acoustic settings:

- **dB Scale:** This shows the SPL scale on the homepage for all the modes. Tap this setting to switch on/off the mode
- **Max dB:** The scale maximum can be set manually (when switched on) or automatically (when switched off).
- **Min dB:** The scale minimum can be set manually (when switched on) or automatically (when switched off).
- **High sample rate:** The device can be switched to the high sample rate of 240KHz, which can be used for high-frequency applications. To switch it between the normal and high sample rate settings, toggle the button and there will be a confirmation screen. Click “Restart” and the device will reboot in the selected mode. The user can also press “Cancel”, if that’s required.
- **Show Marker:** A dB marker will show the sound pressure level of the marker’s location within the selected frequency selection. The marker will be located at the center of the most dominant source within the field of view.
- **Blob Size:** With this setting, the blob size can be controlled, if needed for better visualization of blobs for a certain frequency range. It is recommended to move towards smaller blob size for low-frequency applications, and vice versa.

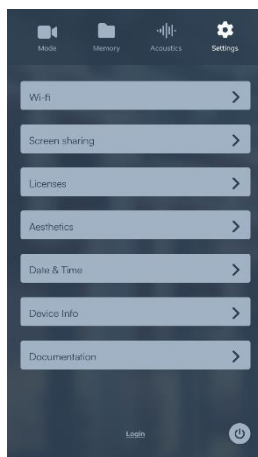


Settings

Tap



to view the general device settings.



1.12. Wi-Fi

Enable a Wi-Fi connection to connect with the internet.

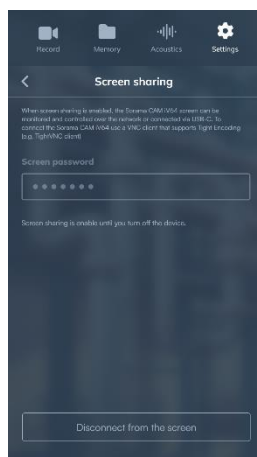
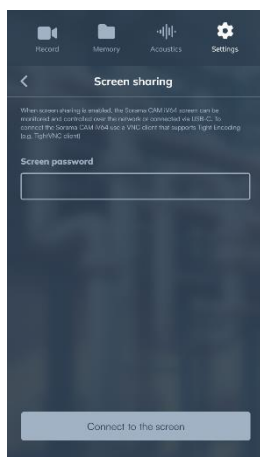
When Wi-Fi is enabled, a list of available networks is shown. To select a network to connect to, click on the network name from the list. The connection strength and security protocol of the selected network are displayed. Click “Connect” to connect to the network, or “Cancel” to go back to the list.

Note: For iPhone users wanting to connect to their iPhone’s hotspot, please ensure that the “maximize compatibility” mode is switched on.



1.13. Screen Sharing

To use the screen sharing the device must be connected to a Wi-Fi network. Connect your Sorama CAM iV64s to the same Wi-Fi network to which your computer is connected and go to the Screen Sharing page on the Sorama CAM iV64s. Here you can set a password and later use the same password to connect and view the Sorama CAM iV64s screen from your computer.

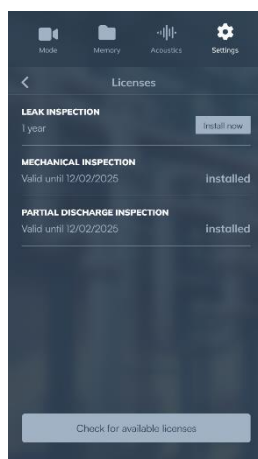


Once you enable Screen Sharing, your Sorama CAM iV64s can be reached using a VNC (Virtual Networking Computer) program if it is compatible with 'Tight Encoding' protocol, it is recommended to use TightVNC Viewer.

You can view everything that happens on the device's screen and control all aspects of the device through the TightVNC Viewer. You can trigger a measurement by pressing the F1 key on your keyboard. (The Screen Sharing password is not changeable while the Screen Sharing is enabled).

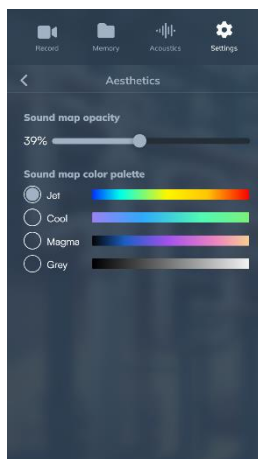
1.14. Licenses

The user will see the list of active licenses appearing here. These available licenses can also be installed using the "Install now" button.



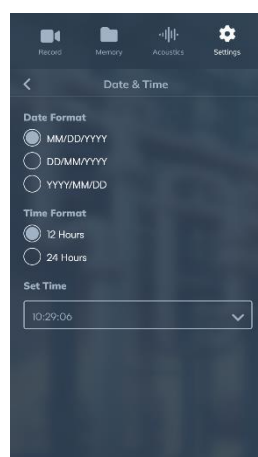
1.15. Aesthetics

This lets the user change the opacity of the soundsurface overlay on the video image with the slider and choose the palette, for the colors of the soundsurface. You can choose between "Jet", "Cool", "Magma" and "Grey".



1.16. Date & Time

Select your preferred Date Format. User can also change settings to the current date and time.



1.17. Device Info

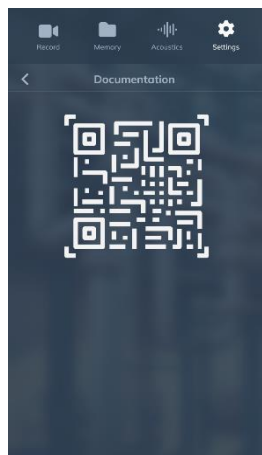
Select 'Device info' to view the 'Firmware version', 'Installed On', 'Device name', 'Device serial number' and 'Language'. This page can also be used to check for new firmware updates, install those updates or to reset the user settings to the default settings.



1.18. Documentation

Scan the QR-code to quickly navigate to the Sorama CAM iV64s documentation page:

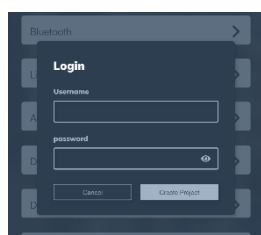
<https://sorama.eu/products/camiv64-ex>.



1.19. Login

This can be used to login to Sorama Portal using the credentials provided by Sorama via the email. The screen below will be shown. Before using the login, please check if the Date and time of the device is updated to the current date and time.

Note: If you have not received the credentials , please contact Sorama by sending an email to helpdesk@sorama.eu.



OPERATIONS

Basics

Power on the device by pressing the trigger button. A LED light, on the left side above the USB-C connector, will be activated when the device is powered on. It takes approximately 30 seconds to boot.

The device opens by default in “Image” mode for the first time use. After the first time use, device will open in the mode, that was being used in the preceding run. To show the menu, swipe down from the top.



The microphone data obtained by the microphone array can be shown on the screen for a specific frequency bandwidth. When the spectrum is visible in the display, the bandwidth can be selected by touching the white dot and drag this dot to the preferred frequency. Execute this for the lower and higher frequency. The user can also move the selected frequency band by touching it in the middle and drag it to the preferred area of the spectrum.

Mount Sorama CAM iV64s on a Tripod

It is possible to mount Sorama CAM iV64s with an external tripod. The external tripod has to be explosion-proof.

As the battery compartment rubber part has to be secured with tripod connector, it is not allowed to mount Sorama CAM iV64s with tripod in hazardous area. All the mounting procedures between the device, battery rubber part and external tripod have to be done outside the hazardous area.

⚠ Caution: As the weight of the product is heavier than normal cameras, choose a tripod that is steady and firm for the product. Be aware of the balance before mounting the product on the tripod. Sorama is not accountable for any damage or harm caused by misuse of a tripod.

A tripod stand with ¼ inch UNC camera screw is needed for the product.

Adjust and secure the legs of the tripod accordingly before mounting the product. Place and mount the tripod under the bottom insert of the product.

Data Transfer

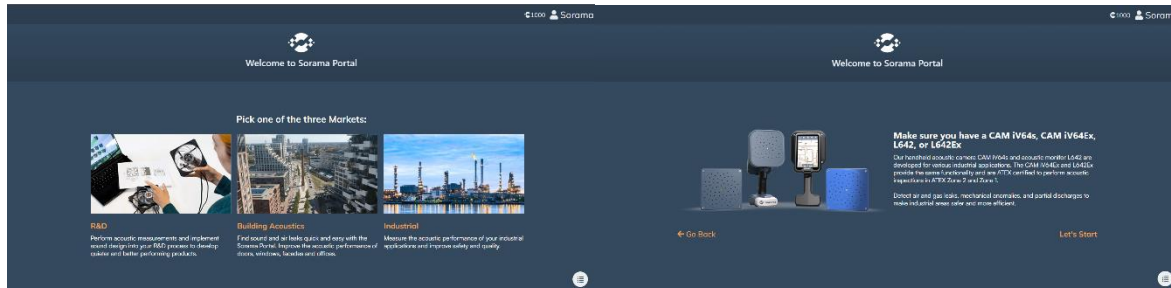
By default, the product continuously streams audio and video data. A short press of the trigger button at the top of the handgrip will start and save a measurement. The video measurements are saved in .mp4 format, and image and all other measurements are saved as screenshots in .png format.

Exporting the measurement data: The data can be exported from the internal memory by connecting the supplied USB-C cable from device to a computer. The measurements can then be accessed via the file explorer on the computer. You will find two folders, namely ‘logs’ and ‘recordings’. In the ‘logs’ folder, there will be the text files with the device logs, which can be shared to Sorama in case of bug fixes for the device. The saved files can be accessed from the ‘recordings’ folder.

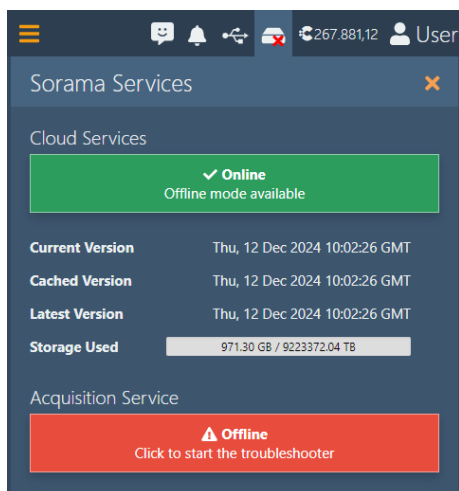
Sorama Portal

Sorama Portal is a tool that can be used for generation of additional reports for the measurements done on device. The user can go to the portal using the following link: <https://portal.sorama.eu/> and "Sign In" using the credentials provided by Sorama.

After the sign in, user will need to pick out, one of the three markets, named as "R&D", "Building Acoustics" and "Industrial". For the device, use select "Industrial" market. The screen with the confirmation of device will come next. Click on "Let's Start", to start the device connection to Sorama portal. The screenshots of the above process are given below:

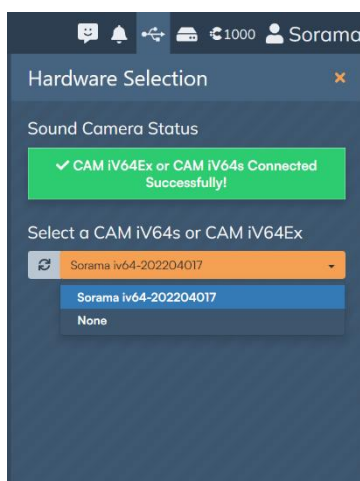


After opening the Sorama portal, firstly, the user will need to download and install the latest version of Sorama Acquisition Client. To download the client, go the "Sorama Services" and then click on "Click to start the troubleshooter" under "Acquisition Service", as shown in the image below. This will lead to a page explaining how to download a file named "SoramaAcquisitionService.exe", install the file using the standard install steps.



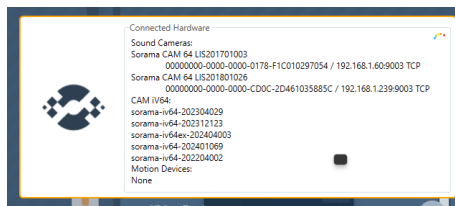
To connect the user will first need to select the Hardware selection icon .

Afterwards you can select your connected CAM iv64s from the dropdown menu.



If you cannot find your CAM iV64 device, you can press the refresh button next to it.

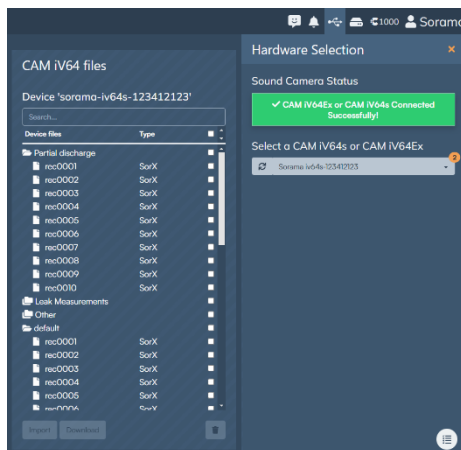
When hovering over the Sorama Acquisition Client you can see the connected devices as shown in the example below.



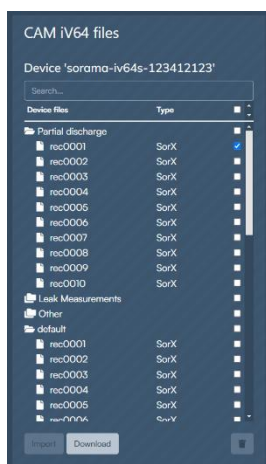
Downloading Reports:

For every measurement performed in the Leak Inspection, Partial Discharge Inspection workflows of the Sorama CAM iV64s, a report can be downloaded when connecting the Sorama CAM iV64s to the Sorama Portal. When the Sorama CAM iV64s has successfully been connected to the Sorama Portal, go to the 'Manage Sorama CAM iV64s files' tab within the Sorama Portal's 'Manage' workflow. The screen will be shown as below:

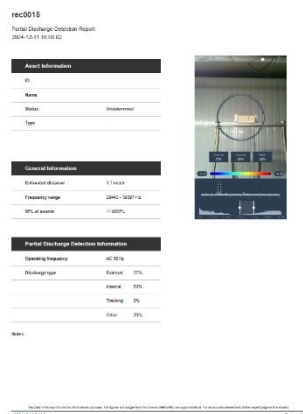
Note: Make sure you are logged into portal using the credentials provided by Sorama via email. If you have not received the credentials , please contact Sorama by sending an email to helpdesk@sorama.eu.



The required measurements, can be selected using the checkbox button in front of the file, and then can be downloaded using the "Download" button as shown on the bottom left corner in the screenshot below:



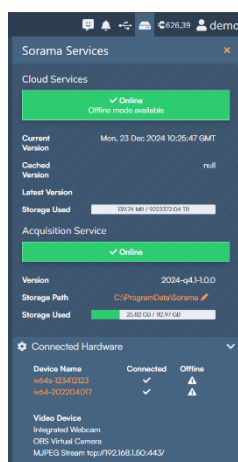
The downloaded file will be a zip, containing the report in .pdf format presenting the result of the measurement as performed on the Sorama CAM iV64s. Below an example is shown of a report that can be downloaded after performing Partial Discharge Inspection.



Feature Licensing

Enable the specific features you need through Feature Licenses. The licenses can be installed through the Sorama Portal.

1. Connect your device via internet through Settings  > Wi-fi .
2. Login to the Sorama Portal (with the same internet network when using Wi-Fi). In the 'Sorama Services'  tab, check if you have installed the latest version of the acquisition client. The screen will be shown as below:



3. Click on your device name in 'Connected Hardware' at the bottom of the 'services' tab. Click on the device name to enter the 'Device Management' page.
4. Here the info like device name, currently installed version and install date can be found. Additionally, this page contains 4 options namely: Packages, Firmware Update, Device Log and Factory Reset.

Device Management

Go back to Hardware Selection

Device:

iv64s-123412123

Currently Installed Version:

2.14.0

Install Date:

2024-12-18

Packages

You have no feature packages, please contact Sorama to buy a package.

Firmware Update

Update device firmware to version 2.14.0

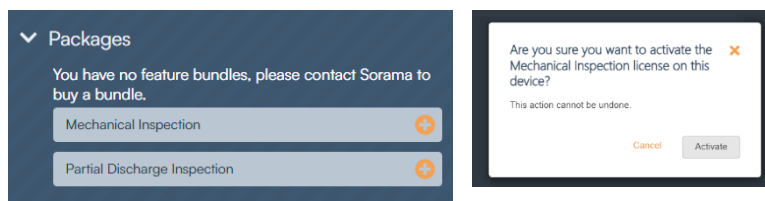
Device Log

Download device logs

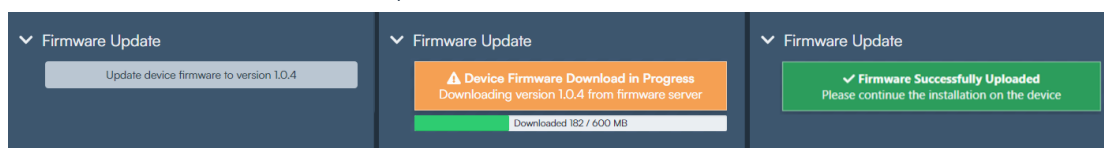
Factory Reset

Perform factory reset

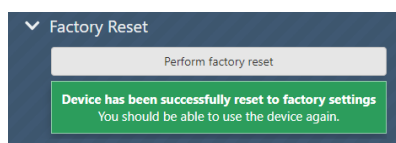
- 4.2. Packages: The required package can be bought and added using the “+” icon, shown adjacent to the package name. As the package is selected, it will show the prompt screen with the message of either Activate or Cancel. Select the required option to install the package on device. After installation, the screen will show the message “Successfully placed the license on your device”. The screen of the process are shown below:



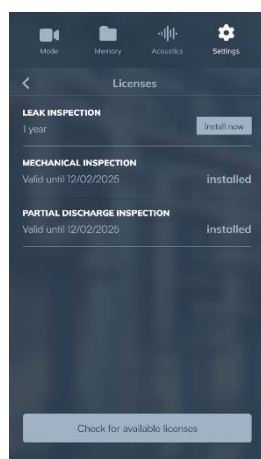
- 4.3. Firmware Update: The device checks for new firmware when connected to internet. If there is new firmware available, it is shown in form of a tab. To update the firmware, click this option, and the new firmware will be downloaded and installed on the device. The screenshots of the online process are shown below:



- 4.4. Device Log: This will show the device logs. These will be used by Sorama for debugging if in case, the device is not functioning properly.
- 4.5. Factory Reset: The device can be reset to the factory firmware version using this option. The screen for the following is shown below:



5. Alternatively, this can be done also from 'Available Online' at 'licenses' on the device once the user has logged into their Sorama Portal account.



When you have more than one device, you can decide on which device to have the features installed. These installed features will then stay on the selected device once it is installed, they cannot be revoked or transferred to another device until it expires. Features which have not yet been installed will be visible on all logged-in devices.

Maintenance

The Imager

⚠ Caution

The imager does not require routine maintenance.

The optical surfaces of the lens are equipped with high-quality optical layers. Avoid any contact with these surfaces and protect these surfaces against dirt and damage.

The case

Clean the case with a clean, damp cloth. Do not use abrasives isopropyl alcohol, or solvents to clean the case or lens/window.

Acoustic Sensor Care

⚠ Caution

The imager has sensitive acoustic sensors. Do not expose the sensors to water or fluids, dust, and other contaminants. Accumulation of these in the sensor will affect the performance.

Environmental

The product has electronic printed circuit boards. These components must be disposed of specifically when the device is at the end of its use.

The manufacturer offers to take back the product from the customer to ensure that the device is disposed of in an environmentally friendly manner when it is at the end of its use.

Contact Sorama if you require more information.

Service

Contact Sorama for information by sending an email to helpdesk@sorاما.eu.

Specifications

Complete specifications are at www.sorاما.eu. See the Sorama CAM iV64s product specifications.