Sorama

make sound insightful

Sorama CAM iV64 – User Manual

Document version 2.0 - 29/04/2024

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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 products:

Product name	**Acoustic Camera**
Model number	**CAM iV64**

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

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info@sorama.eu

Signed for and on behalf of Sorama B.V.

Address: Achtseweg Zuid 153H, 5651 GW, Eindhoven

Safety Information

This document contains important information, which should always be available to the operator(s) of the instrument 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 instrument can only be operated in accordance with these instructions and local safety regulations.

This instrument is intended only for the measurement of sound and vibration. The instrument 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 operation safety and functionality of the instrument.

To prevent possible electrical shock, fire, or personal injury follow these guidelines:

• Read all safety information before you use the Product.

• Use the Product only as specified, or the protection supplied by the Product can be 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.

• 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.

• Have an approved technician repair the Product.

• Contact Sorama when the battery leaks.

• Remove the batteries if the Product is not used for an extended period of time, or if stored in temperatures above 35 °C. The Product can be damaged If the batteries are not removed.

• Use only Sorama approved power adapters to charge the battery.

• Do not keep cells or batteries in a container where the terminals can be shorted.

• 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 (>50 °C) during the charge period.

Battery

Specifications:

Type	RRC2057
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)	85.35mm x 77.65mm x 23.0 mm
Weight	230g

⚠⚠Warning

To prevent personal injury and for 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 the charger.
- 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 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 at six-month intervals 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 Coimmunostains Commission.
	Dispose of this product according to local Regulations. Do not dispose of this product as unsorted municipal waste.
	Cautionary notice!
	consult accompanying documents

Contacts

Supplier will, during the warranty period in office hours (GMT +1), provide the required first line support when possible technical faults occur. Customers can request support by sending an email to support@sorama.eu. After receiving the defect checklist, the customer should send this document filled out back to support@sorama.eu. Sorama will then evaluate the problem. When the issue does not have any relation to the services of Sorama or is outside the warranty period, costs will be charged to the customer.

1 Description

The Sorama CAM iV64 is a state-of-the-art acoustic camera, which enables you to show both highly accurate sound levels and localize where sound is coming from on the 7-inch touch display.

Specifically designed for users who want mobility and have instant reliable acoustic information available to them, in order to perform in-field measurements with confidence.

1.1 Features

- Class 1 performing sound level meter functionalities
- Realtime spectrum
- Realtime spectrogram
- Far-Field sound source localization and visualization
- Measurement workflows for norm measurements
- Sorama Portal compatible data for in-depth analysis

2 Technical Data

2.1 Physical Properties

Size (LxWxD)	42 x 32 x 16 cm	L x W x D
Weight	2.33 kg	Including battery
Connectivity	USB-C	USB 3.0
Battery	Rechargeable & swappable smart battery	Battery life ±4 hours
Hardware connections	1/4” screw connection	Tripod mountable

2.2 Storage

Internal	Approx. 7Gb	
External	Up to 1Tb	Storage expandable with USB-C fast drive or Additional purchasable SSD storage memory
Storage formats	Sorama File Format (.sor file) containing video-, acoustic data and measurement specific metadata. And .Jpeg or .PNG image files.	Sorama data format is compatible with Sorama Portal for data analysis

2.3 Display & Camera

Touch display	7-inch LCD capacitive touchscreen
Display resolution	720x1280
Camera Resolution	1280x960

2.4 Microphones

Type	MEMS	Digital Bottom Port
SNR (A-weighted, at 1 kHz)	66 dB for 94 dB SPL	At 1 kHz per channel
Sensitivity	-37 dBFS +/- 1 dB	At 1 kHz, 94 dB SPL
Acoustic Overload Point	132 dB SPL	At 1 kHz, <10% THD

2.5 Measurement Features

Sampling rate	240 kHz	
Spectrum analysis	29 Hz – 27 kHz*	
Spectrogram analysis	0-10s+ 29 Hz - 27 kHz*	Streaming + recording
Beamforming (far-field)	500 Hz – 27 kHz*	Streaming + recording

*Upgradeable frequency ranges up to 54 kHz or up to 108 kHz on special request

3 Environment

3.1 Ambient Temperature

The CAM iV64 is capable of operating in ambient temperatures between 2°C to 50°C (35.6 °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).

3.2 Protection

⚠ **Warning**

The AOP (Acoustic Overload Point) of the microphones is 132 dB and 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.

4 Getting Started

4.1 List of Items

Items listed below are included when you receive 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	CAM iV64 Acoustic Camera	1
6	Protective Case	1
7	Accessory Bag	1
8	Shoulder Strap	1
9	Hand Strap	1

4.2 Hardware feature and configuration

Item	Function	Item	Function
1	LED Indicator	5	Battery Compartment/ Tripod Connector
2	USB-C Connector	6	Acoustic Sensor/ Webcam
3	Touchscreen Display	7	- Power on / Measurement Trigger Button - Force Shut Down
4	Shoulder Strap Anchor	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.

4.3 Terms to know

1. **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).
2. **SLM (Sound Level Meter)**
   Sound Level Meter indicates the Sound Pressure Level (SPL) as measured by the Product.
3. **Frequency Spectrum**
   Frequency Spectrum is the distribution of the amplitudes (dB SPL) of each frequency component against frequency (Hz). In other words: Your signal recording consists of different frequency components which all contribute to the sound.
4. **Spectrogram**
   Spectrogram can show a sudden onset of a sound. Often it can be easier to see clicks and other glitches in this view rather than in a time or spectrum analysis.
5. **Field of view (FOV)**
   Horizontal/Vertical observation angels of the webcam. The FOV depends on how many features are opened (Spectrum, Spectrogram and dB SPL meter). When opening more features on the Sorama CAM iV64 screen, the horizontal FOV will increase and the vertical FOV will reduce slightly.
   No features open: Horizontal FOV 23.8° and Vertical FOV 41°
   All features open: Horizontal FOV 53° and Vertical FOV 38.2°.
6. **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.
7. **Frequency and Time Weightings**
   When measuring sound pressure level variations, it is important that the sound level meter can give an accurate representation of what the human ear hears. Frequency weightings are used to correlate the SPL at each frequency component for different applications. Frequency weightings that can be applied are Z, A, B and C.
   The streaming SPL varies rapidly in time on display, time weightings act like a buffer for desired time-engagement. The time weightings that can be applied are Impulse, Fast and Slow.
8. **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.

4.4 Power up and LED Indicator

Push 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 CAM iV64 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
Green (flashing)	The device is in sleep mode

4.5 Home screen

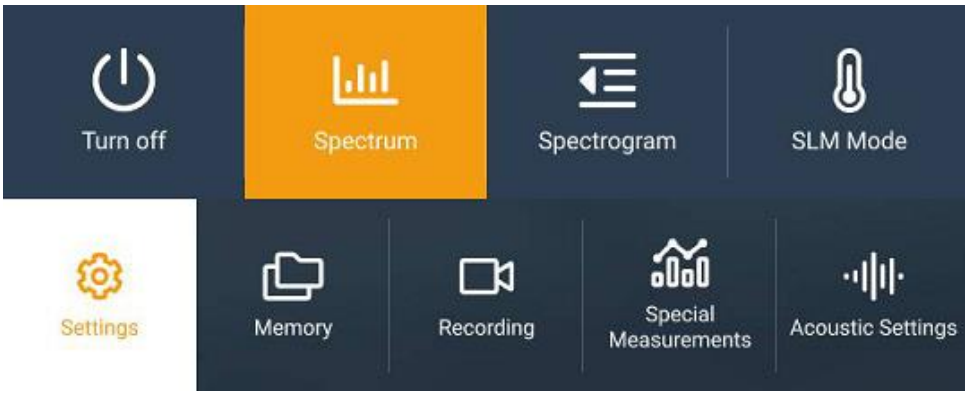
When the device is fully booted, the home screen contains several icons. The meaning of the icons is as follows;

	External USB drive connected
	Battery level
	Storage space is less than 1 GB
	Recording disabled, memory full.
	Wi-Fi connection
	Bluetooth
	Screen sharing
	blob size indicator, for adjusting the size of beamforming blob

4.6 Menu

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

You 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 device. When the icon is selected it will turn orange (upper row) or white (bottom row). You can touch the icon again or press the “X” to close the feature or setting.



The following features and settings are included.

Turn off: With this feature the device can be turned off

Spectrum: This feature shows the spectrum of the microphone data obtained by the microphone array

Spectrogram: This feature shows the spectrogram of the microphone data obtained by the microphone array

SLM Mode: This feature shows the sound pressure levels of the microphone data obtained by the microphone array Recording: In this menu the type and duration of a sound measurement can be set.

Settings: In this menu the settings of the device can be viewed and/or adjusted

Memory: This is the menu showing the saved recordings and enables to transfer, rename and/or delete recordings.

Recording: In this menu the type and duration of a sound measurement can be set.

Special Measurements: With this feature the formats for special measurements can be chosen

Acoustic Settings: In these menus you can adjust the acoustic settings of the device

4.6.1 Turn off

Tap

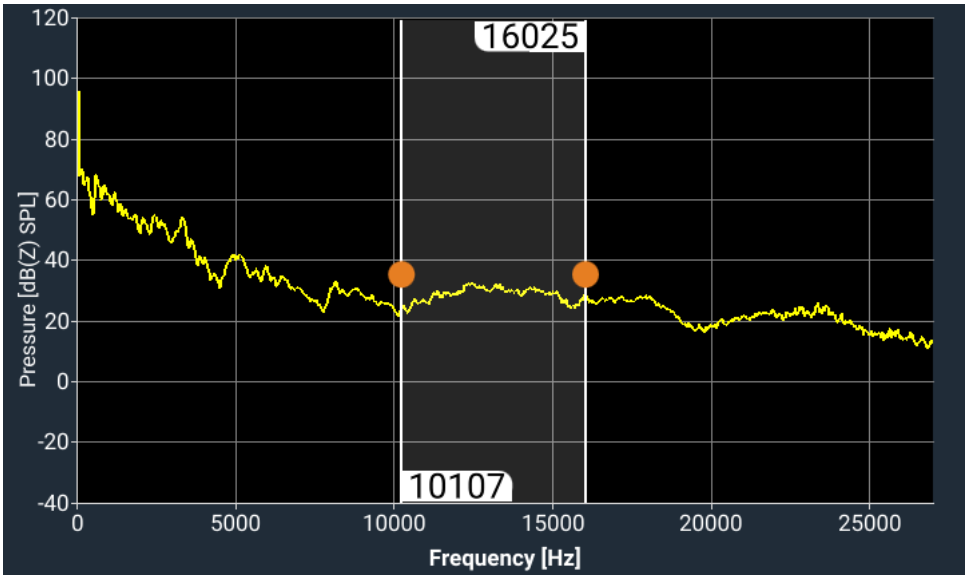
to power off the device.

Another option to power off the device is to press the trigger button for 2 seconds. When a hard reset is needed for the device, press the trigger button for 8 seconds.

4.6.2 Spectrum

Tap

to view the spectrum. This feature shows the spectrum of the sound.



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 orange dot and drag this dot to the preferred frequency. Execute this for the lower and higher frequency. You can also move the selected frequency band by touching it in the middle and drag it to the preferred area of the spectrum.

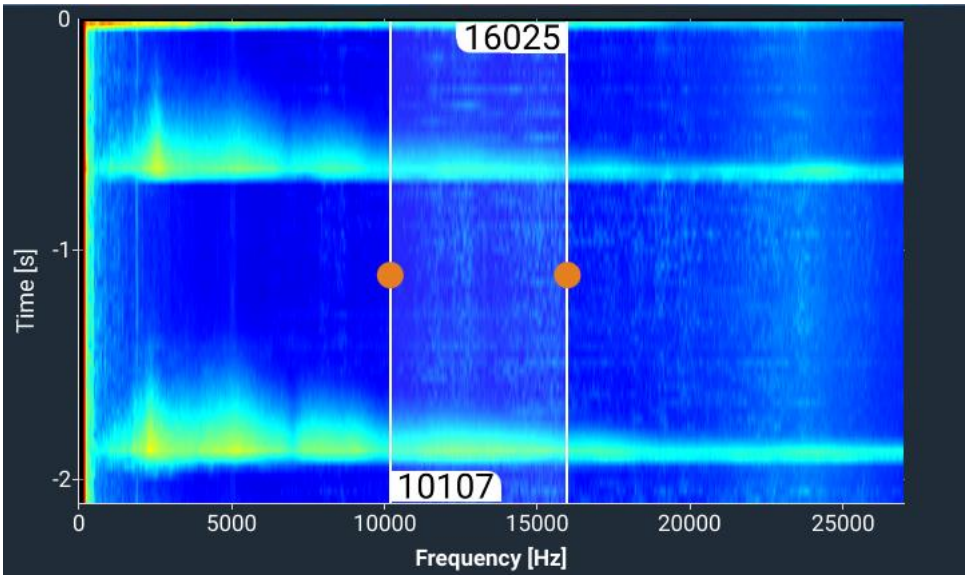
Spectrum zoom

By double tapping or pinching in the spectrum module you can zoom in on the selected frequency band for a more detailed view.

4.6.3 Spectrogram

Tap

to view the spectrogram.



To select a specific bandwidth, please review the explanation described in the previous paragraph §4.6.2 Spectrum.

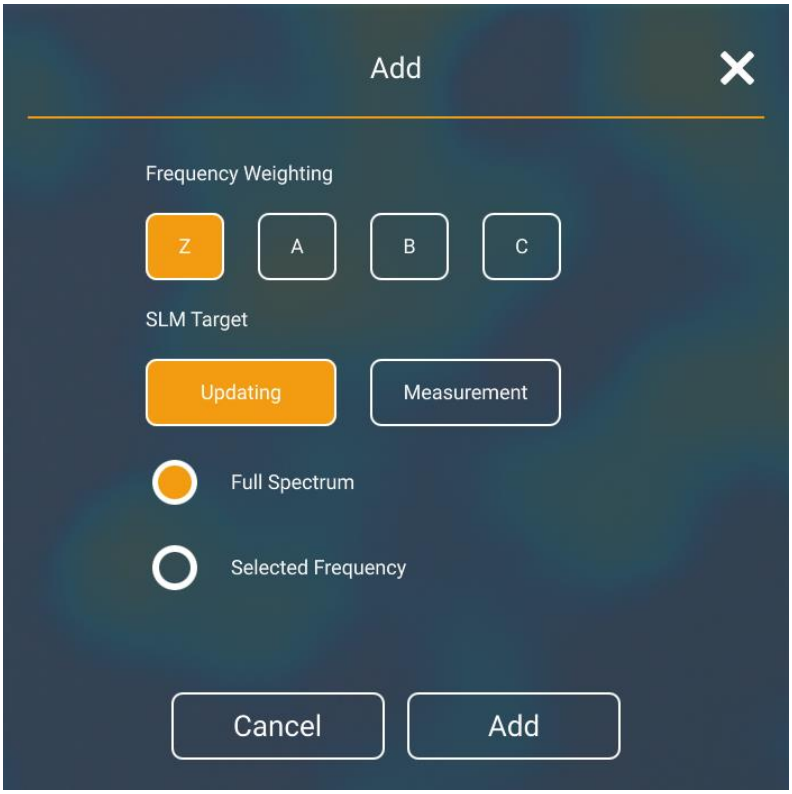
4.6.4 SLM mode

Tap

to view the sound pressure level of the microphone data obtained by the microphone array.

Tap

to add another weighting for the SPL measurement.



Settings
Choose a frequency weighting (Z, A, B or C), SLM target ('Updating' or 'Measurement') and choose the option 'Full Spectrum' or 'Selected Frequency'.

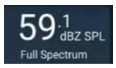
SLM Target
Selecting 'Updating' SLM target, will refresh the displayed dB value every second. Selecting 'Measurement' SLM target, will start to collect dB levels when a measurement is started until the measurement is stopped. After the measurement is stopped it will average these levels over the measurement duration and show the corresponding value.

'Full spectrum' will show the measured sound pressure level over the entire frequency range from 28.2 Hz to 22387.2 Hz (i.e spanning over the 1/3 octave bands with center frequencies of 31.5 Hz to 20 kHz). 'Selected Frequency' will only take the frequencies into account that are currently selected

with the frequency slider (selectable in spectrum and spectrogram modules). By changing the selected frequencies, the selection in this SLM entry will automatically change too.

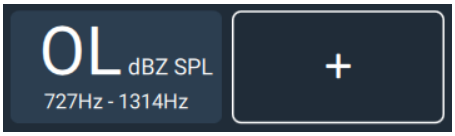
Press ‘Add’ to add the new entry into the SLM module.

Adjusting SPL values

Tap  to adjust the settings in the screen.

Tap to close the tab or to remove the SPL mode.

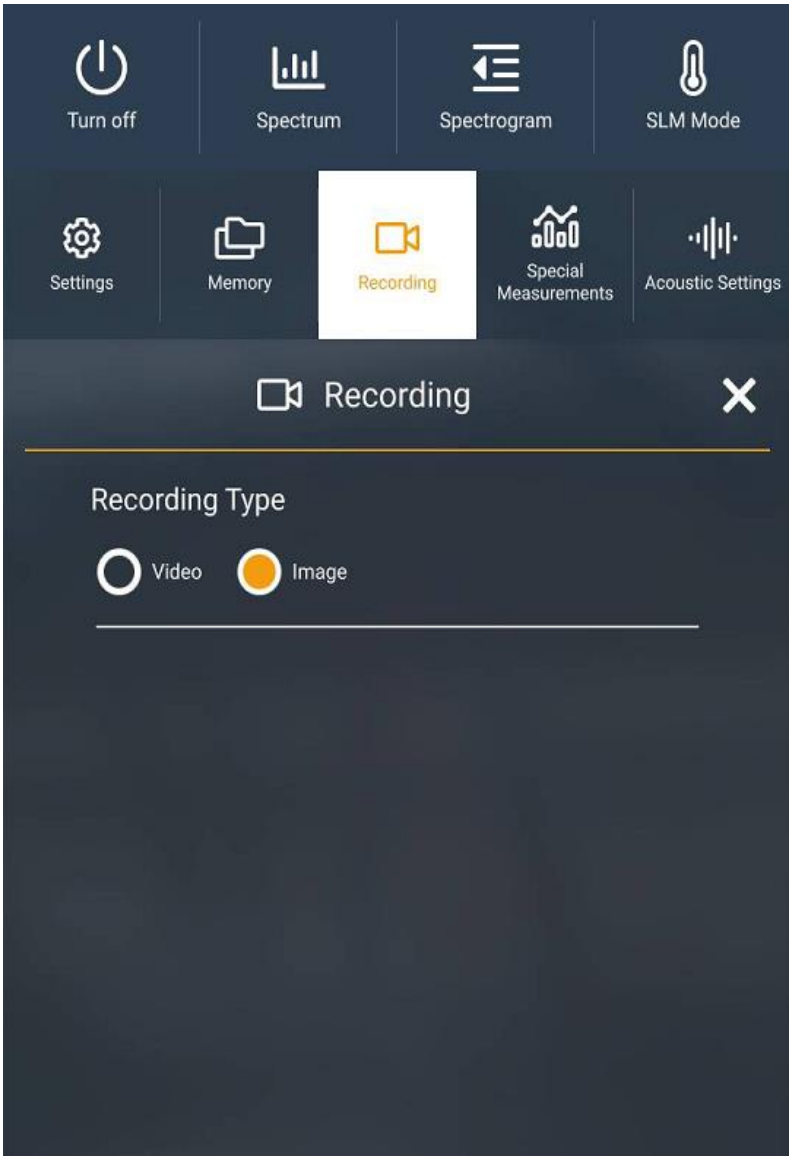
Whenever the acoustic overload point of one of the microphones is reached which is specified at 132 dBSPL, the SLM will indicate this using ‘OL’, short for Overload.



4.6.5 Recording

You can select the types of capture, either in image or video mode, length of the video capture and pre-recording time in Recording.

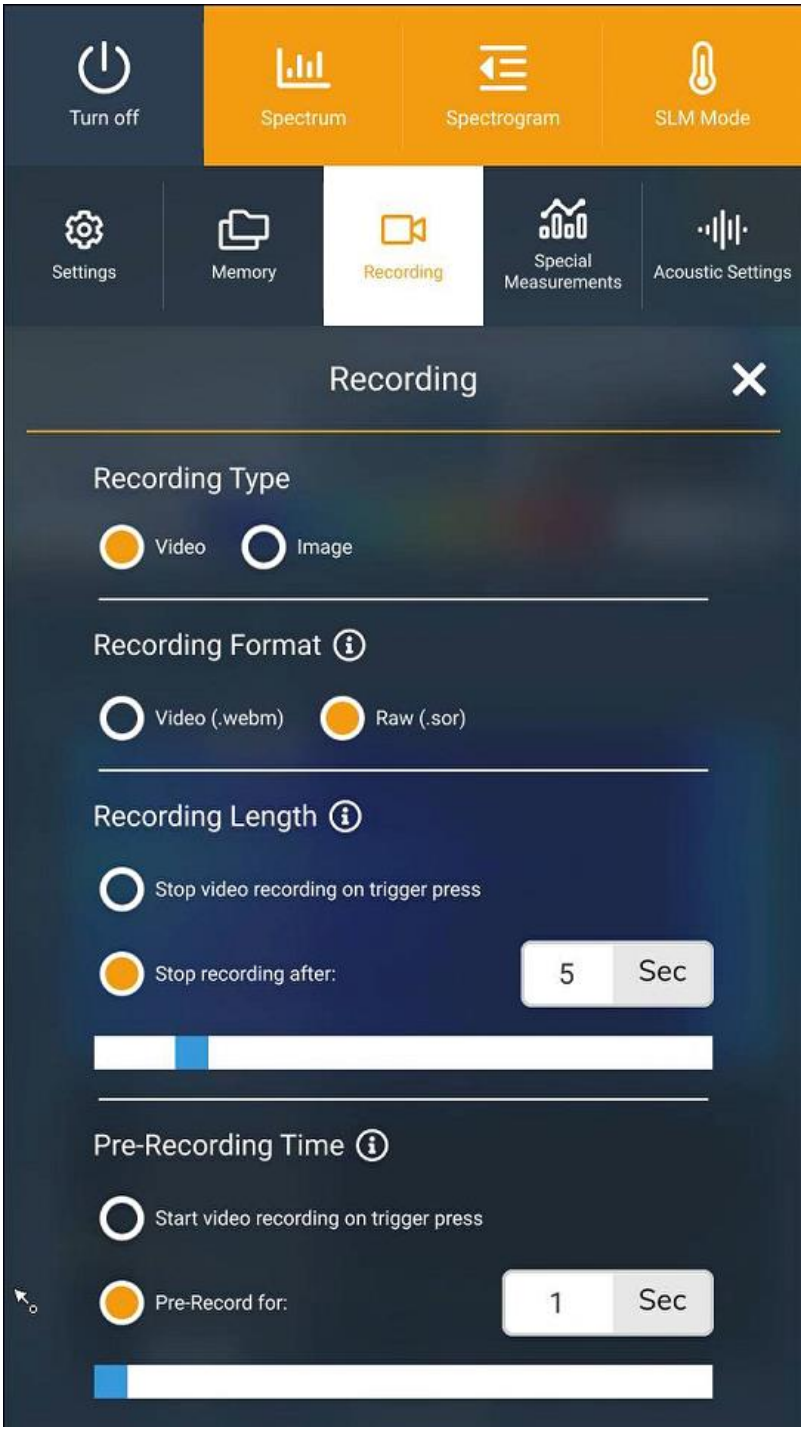
Tap to adjust the recording settings of the sound measurement.



Firstly, you can select the recording type of the measurement you will perform. You can choose between an image screenshot or a video in the format of .sor or .webm. The difference between the .sor and .webm extensions is that the .sor file contains Raw audio data which allows for further processing in the Sorama Portal, while the .webm file is only a smaller size video file which makes sharing of recordings quicker.

An image screen shot can be taken by pressing the trigger button of the CAM iV64.

Whenever recording a video, by default the ‘Stop video recording on trigger press’ is selected. To start recording you can press the trigger button. The icon in the home screen will show the recording time.

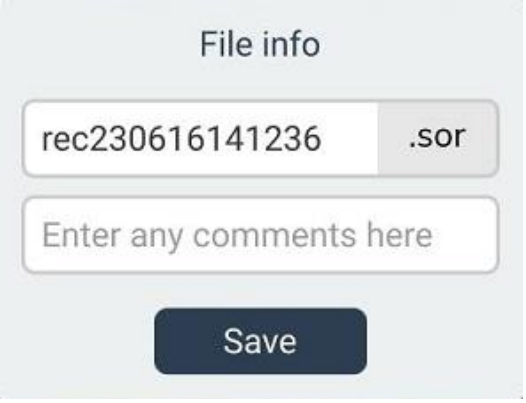

Turn off
Spectrum
Spectrogram
SLM Mode
Settings
Memory
Recording
Special Measurements
Acoustic Settings
Recording
Recording Type
Video
Image
Recording Format
Video (.webm)
Raw (.sor)
Recording Length
Stop video recording on trigger press
Stop recording after:
5
Sec
Pre-Recording Time
Start video recording on trigger press
Pre-Record for:
1
Sec

If you use the setting ‘Stop recording after’ the recording will automatically stop after the selected duration has passed.

Pre-recording time is an amount of seconds that will be kept in memory at every moment. When a recording is started, this pre-recorded time will be available in the recording. This is especially useful at times you wish to record an event that happens at random intervals.

After you have performed a measurement, a window will appear on the screen in which you can set the measurement name. This can be done by tapping on the measurement name in the text box and changing the default name to a desired name. Press on ‘Save’ to store the measurement under the new measurement name.

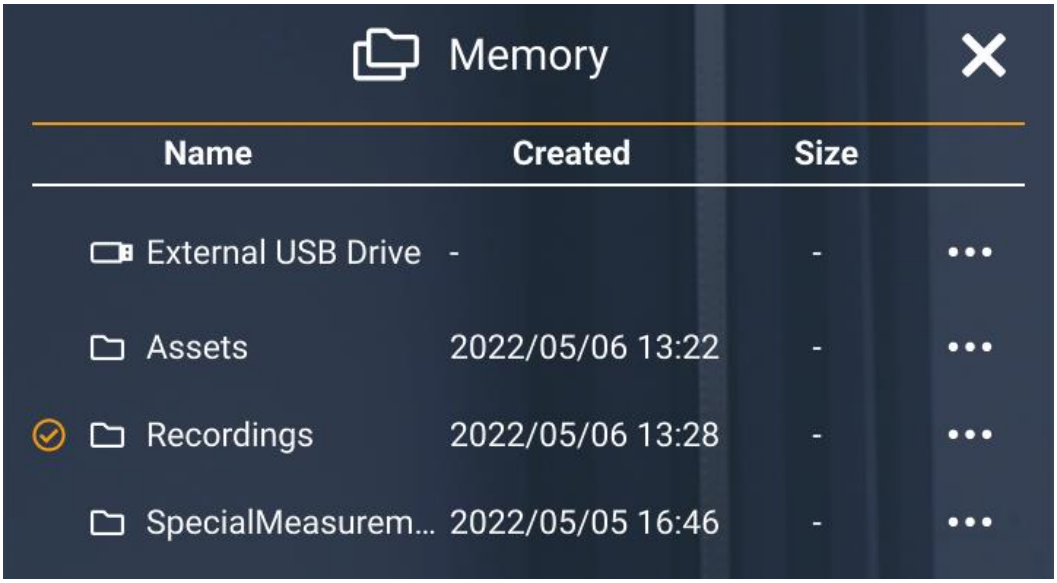
Furthermore, there is an option to add notes to the performed measurement. This can be done by typing text in the text box ‘Enter any comments here’.



4.6.6 Memory

You can view all the saved recordings and transfer, rename and/or delete recordings in the device storage and external USB .

Tap Memory to access the file storage.

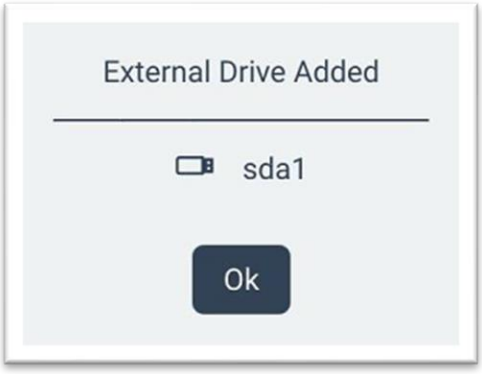


The orange tick icon on the left indicates the current destination folder in which all the recordings will be stored when performing measurements, tap ... to rename, set another folder as destination folder and delete the selected folder.

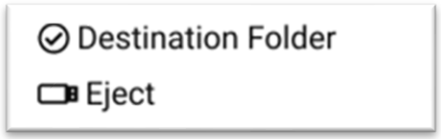
You can view how much device storage is used, what the memory limit of the device is and create a new folder for different recordings on the bottom of the screen.

External USB Drive

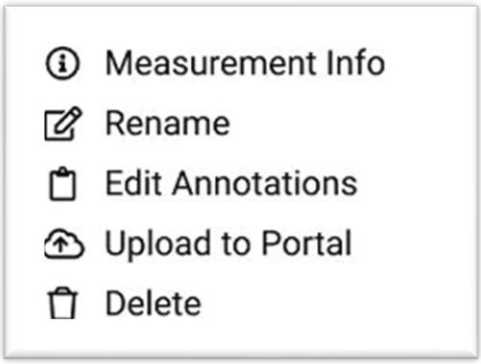
Alternatively, you can use an external USB drive (USB-C port) for data storage. Once it is connected to the CAM iV64, a window will pop up indicating the USB drive is recognized.



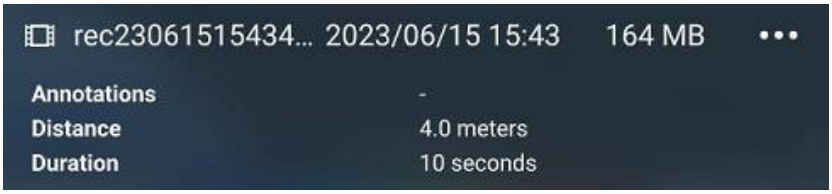
Tap ... to set the USB drive as ‘Destination Folder’ or to ‘Eject’ the USB drive.



To edit saved data, extra information about performed measurements can be viewed by tapping the three dots on the right side of the measurement name ....

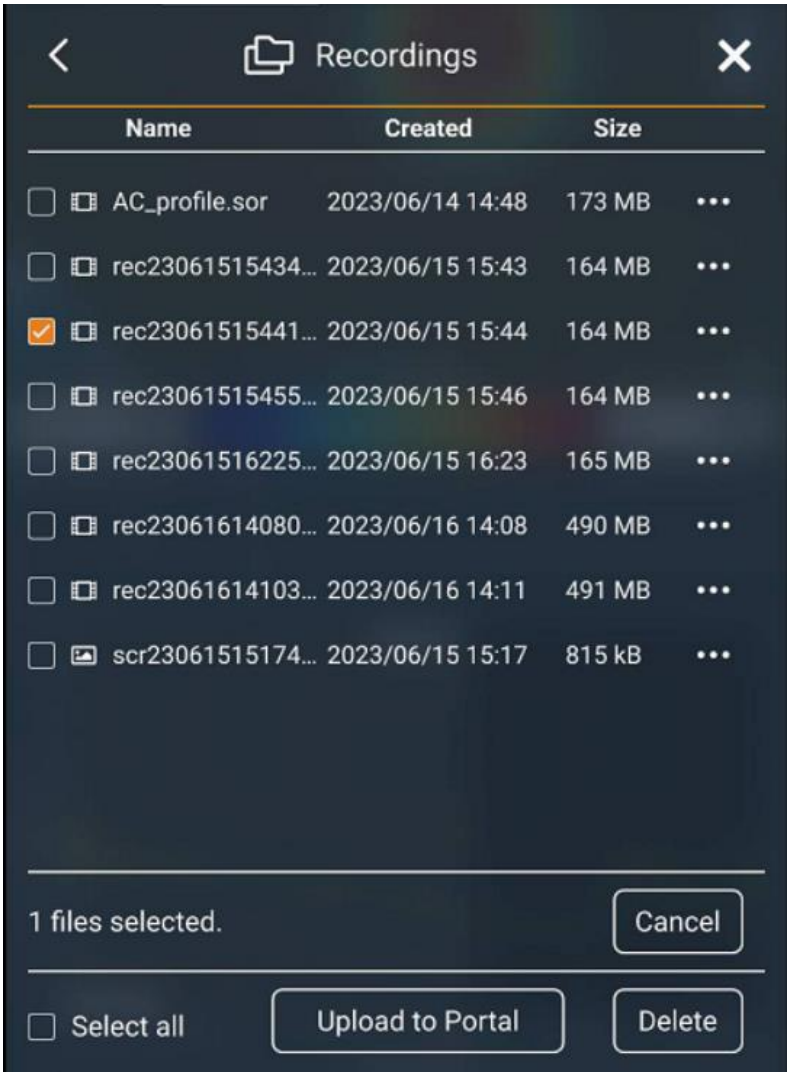


After tapping on the three dots, choose ‘Measurement Info’. Rows will appear below the measurement name containing information in the form of ‘Annotations’, ‘Distance’ and ‘Duration’. All topics will contain information about the selected measurement.



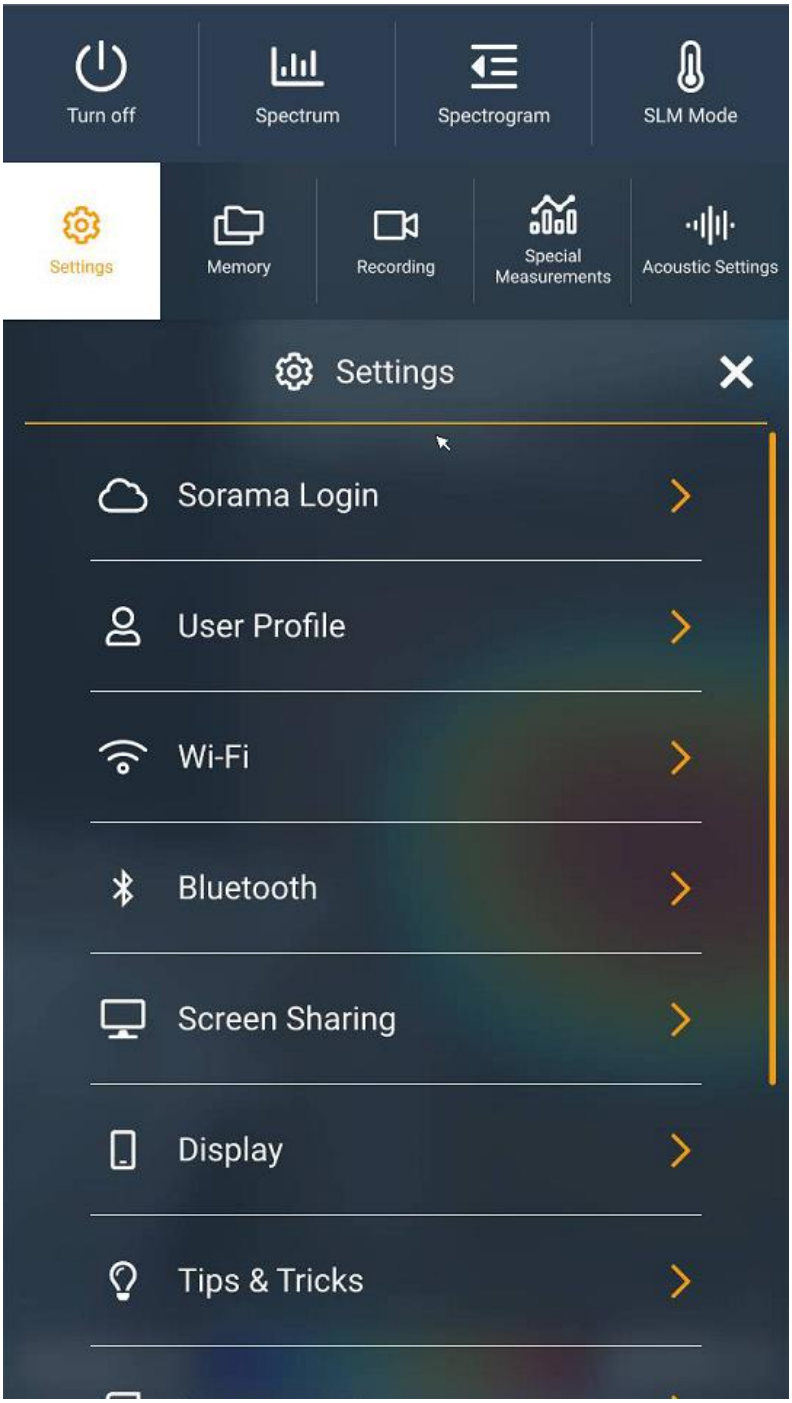
Whenever you have not added any annotations yet to your measurement, you can still do this by tapping the three dots on the right side of the measurement name and choosing ‘Edit Annotations’. A text box will appear in which you can describe the measurement conditions.

Additionally, you can enable the multiselect mode by keeping your finger pressed down onto a folder. You can select multiple files and folders to either delete or copy to an external USB drive or Sorama Portal at the same time. For more details, please refer to Section 6 Data Transfer.

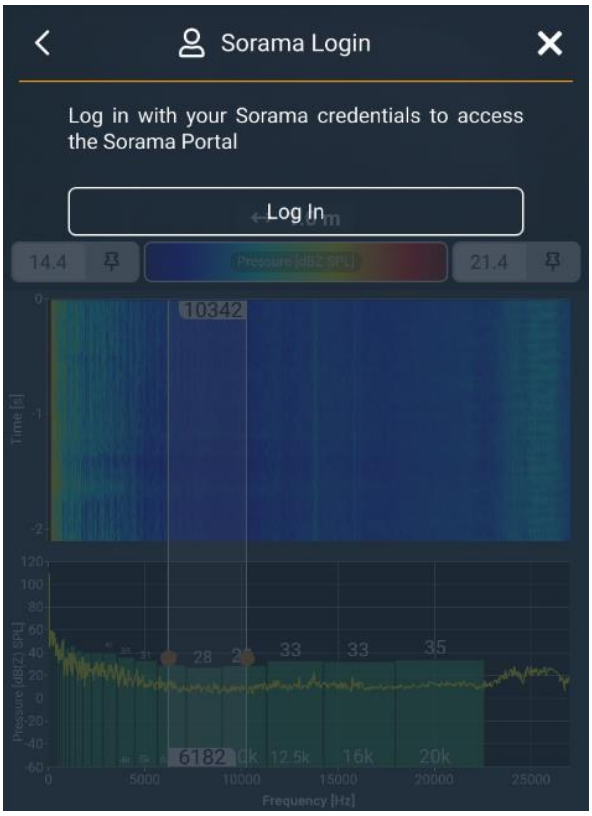


4.6.7 Settings

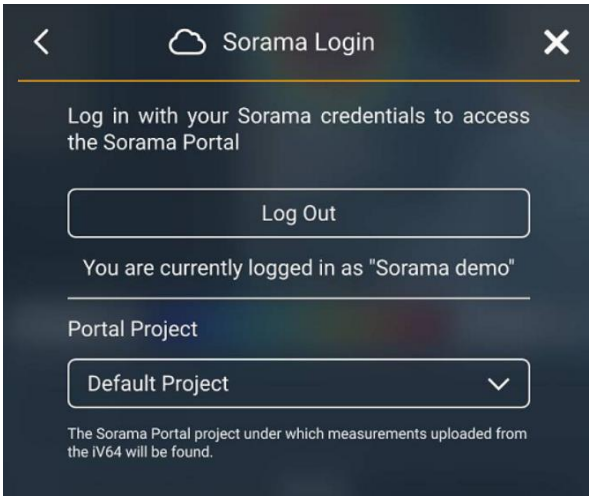
Tap to view the general device settings.



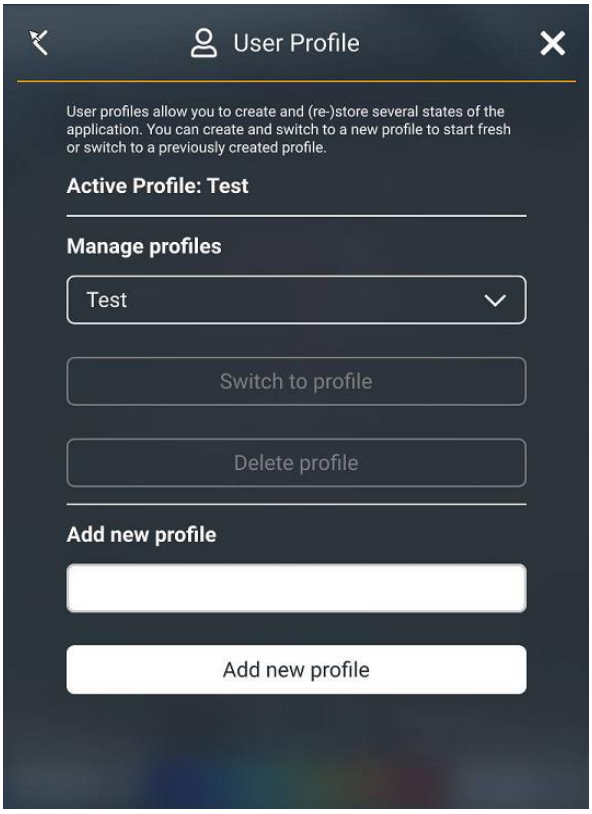
Sorama Login Log in with your Sorama credentials to access the Sorama Portal. This feature is only available when connected to a Wi-Fi network with internet connection.



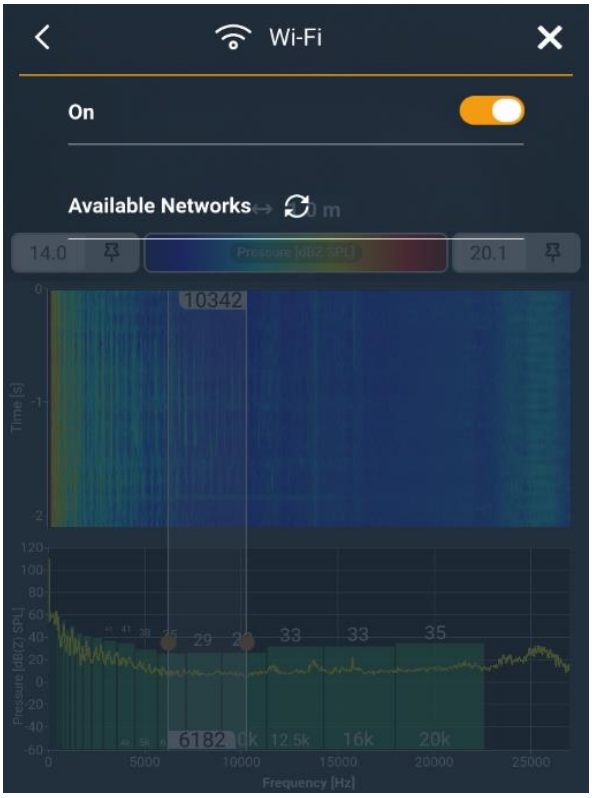
Once it is logged in, you can select an active project to which files uploaded from the 'Memory' will be added on the Sorama Portal.



User Profile Personalize settings for multiple users or workflows on one device. You can add, switch or delete between the profiles for different device settings, while the memory remains accessible for all users. This feature affects settings such as Sorama login account and selected project, acoustic settings and recording settings.

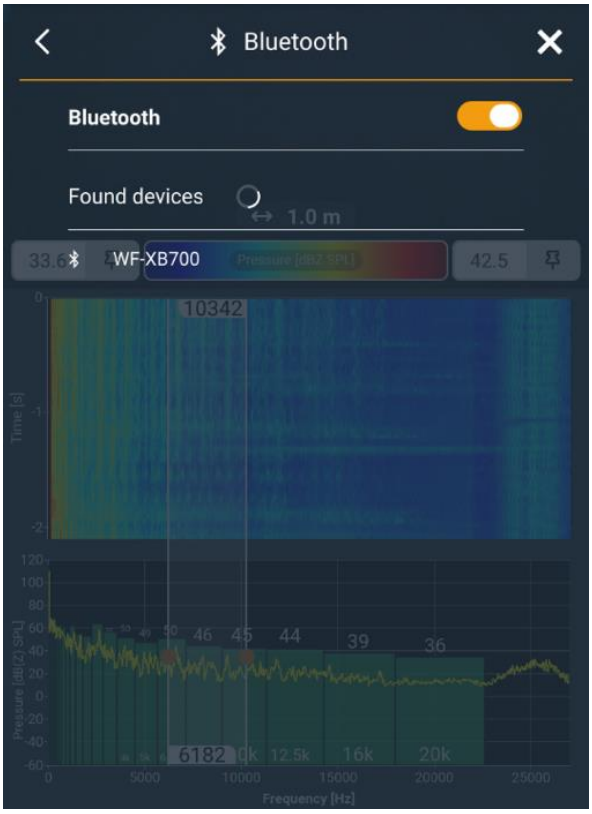


Wi-Fi Enable Wi-Fi connection to connect with the internet. The Wi-Fi connection can be used to connect to the Sorama Portal, execute firmware updates, or enable the screen sharing feature.



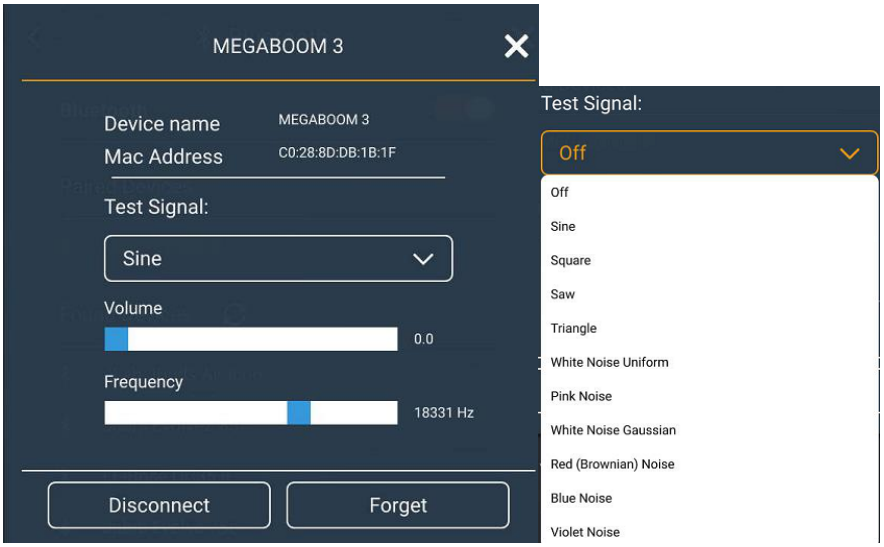
When Wi-Fi is enabled, a list of available networks is shown. To select a network to connect to, click on the network name from the list. The connection strength and security protocol of the selected network are displayed. Click “Connect” to connect to the network, or “Cancel” to go back to the list.

Bluetooth Enable Bluetooth connection to connect with Bluetooth devices. With a Bluetooth connection, it is possible to play a selection of test signals (user-provided test signals are not supported) to a Bluetooth speaker or replay recorded measurements to a Bluetooth headset.



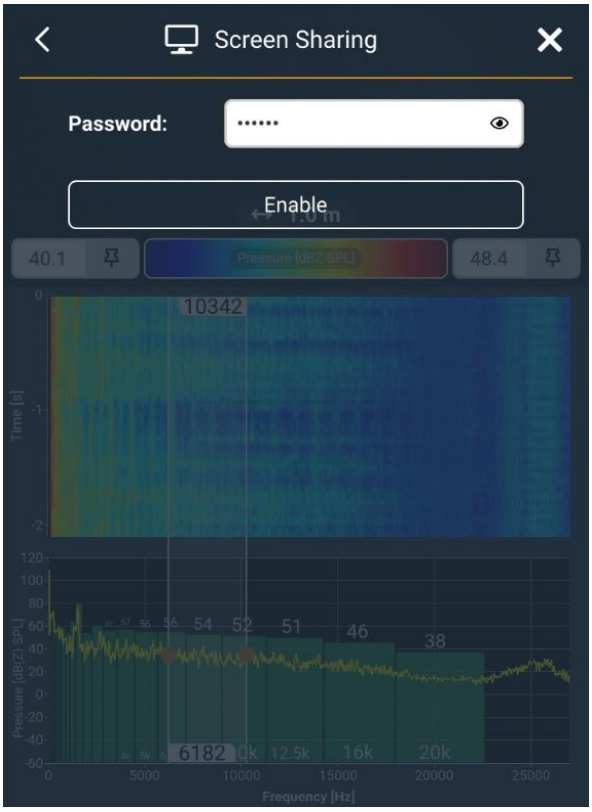
When Bluetooth is enabled, a list of available Bluetooth devices is shown. To select a device to connect to, click on the device name from the list. To refresh the list of devices, click the Refresh button.

Once you are connected to a Bluetooth device, you can stream audio to it. To stream a test signal, click on the connected Bluetooth device. A menu with the test signal options will show up, in which a number of tonal and noise test signals can be chosen. Depending on the type of the chosen test signal, you can set the Volume and/or frequency with the respective sliders.

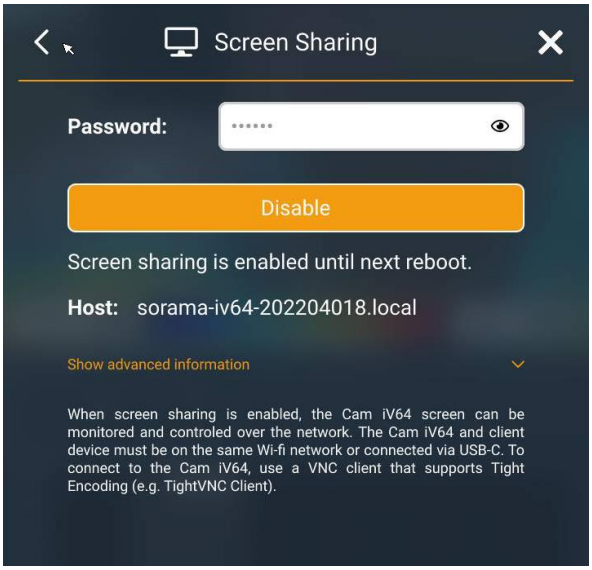


Click again on the device in the Bluetooth menu to disconnect or to forget the device.

Screen Sharing This is a licensed feature. To use the screen sharing the device must be connected to a Wi-Fi network. Connect your CAM iV64 to the same Wi-Fi network to which your computer is connected and go to the Screen Sharing page on the CAM iV64. Here you can set a password and later use the same password to connect and view the CAM iV64 screen from your computer.

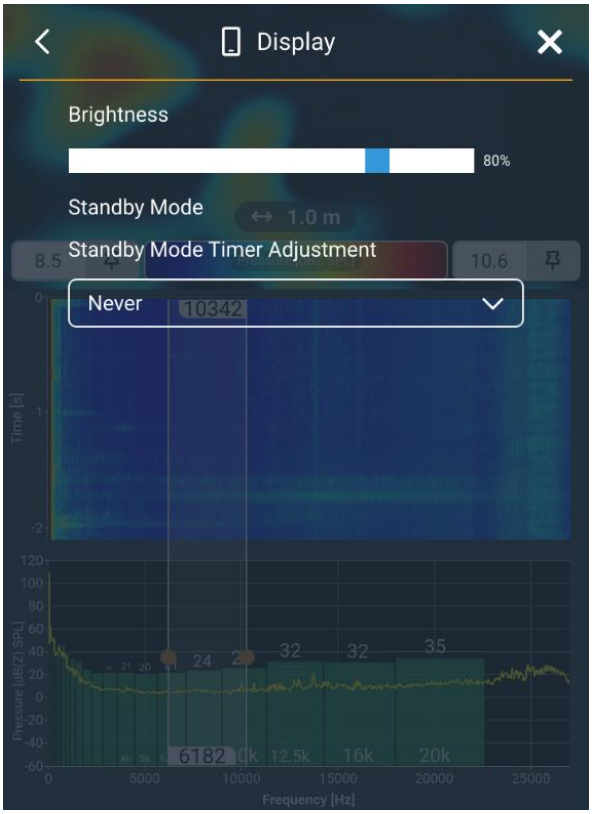


Once you enable Screen Sharing, your CAM iV64 can be reached using a VNC (Virtual Networking Computer) program if it is compatible with 'Tight Encoding' protocol, it is recommended to use TightVNC Viewer.

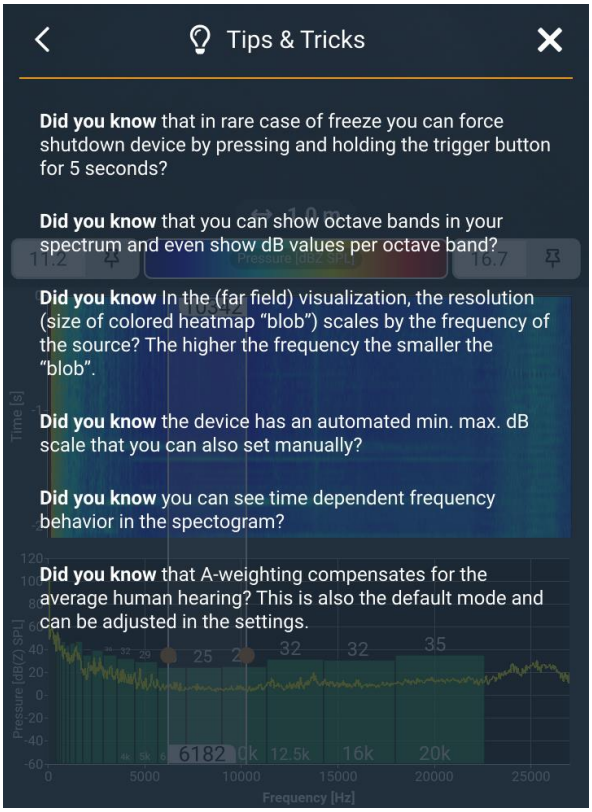


You can view everything that happens on the device's screen and control all aspects of the device through the TightVNC Viewer. You can trigger a measurement by pressing the F1 key on your keyboard. (The Screen Sharing password is not changeable while the Screen Sharing is enabled.)

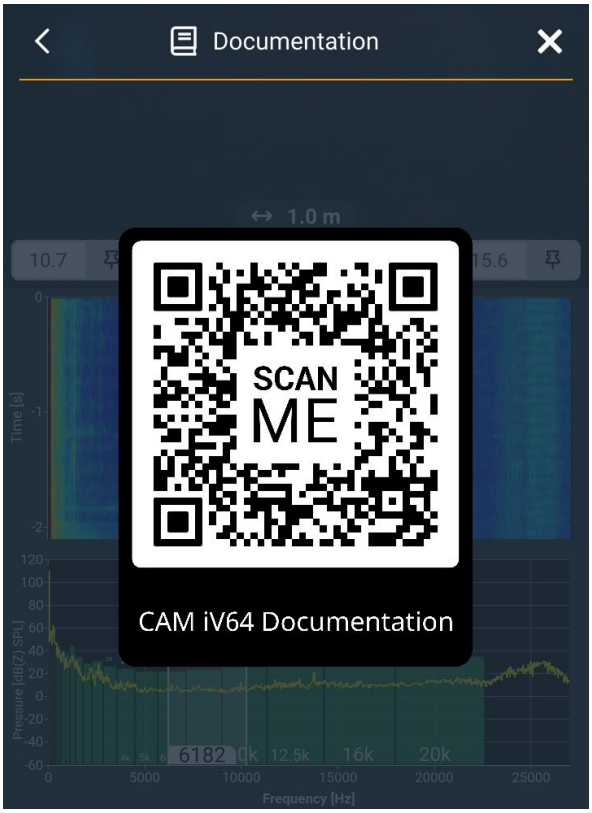
Display Select 'Display' to adjust the 'Brightness' of the screen with the slider. Less Brightness will save battery. Change the time after which the unit goes to sleep with Standby Mode.



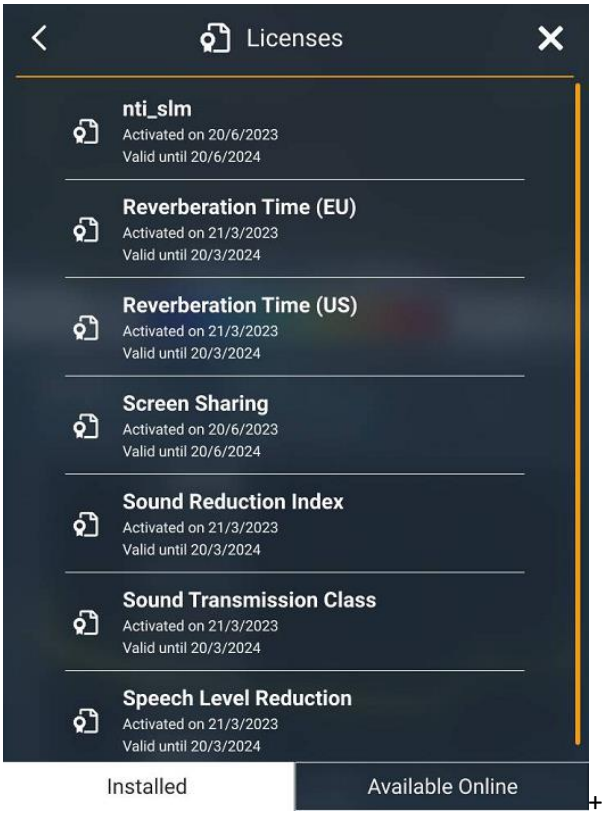
Tips & Tricks Select 'Tips & Tricks' to view tips and tricks that can be helpful for executing a measurement.



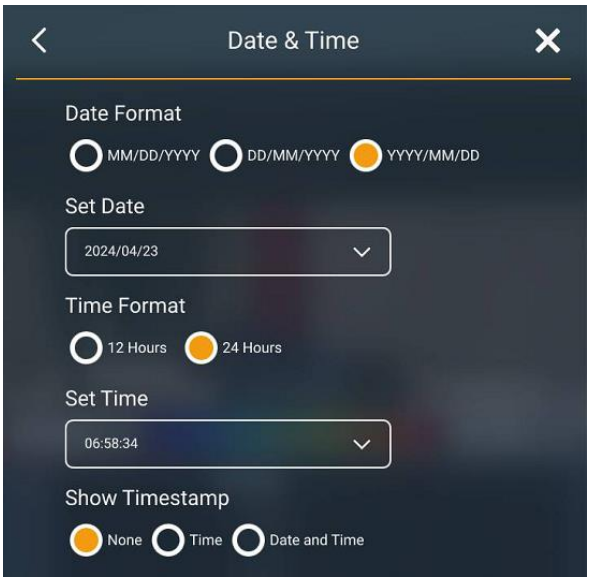
Documentation Scan the QR-code to quickly navigate to the Sorama CAM iV64 documentation page: https://sorama.eu/camiv64-documentation



Licenses a list of active licenses will appear here. For details on how to enable specific feature licenses to your device, please refer to paragraph §5.4.



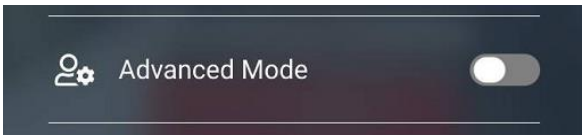
Date & Time Select your preferred Date and Time Format. You can also change settings of the current date and time. Furthermore, you can select to show a Timestamp on the screen. This timestamp will be included in any recording.



System Info Select 'System info' to view the 'Firmware version', 'Installation date', 'Device name', 'Device Serial number' and 'WiFi MAC Address'. This page can also be used to check for new firmware updates or to reset the user settings to the default settings. For details on how to perform a firmware update please refer to paragraph §7 Firmware Update/Factory Reset.

Advanced Mode

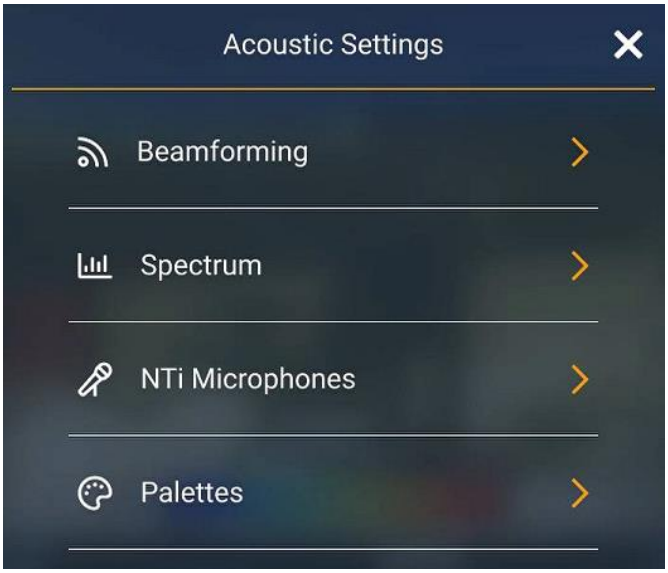
Whenever being in the Airtightness Beamforming Mode (simplified user view) and it is desired to perform measurements using more advanced options (such as making a frequency range selection or changing the beamforming distance), switch on the Advanced Mode by moving the slider in the image below to the right.



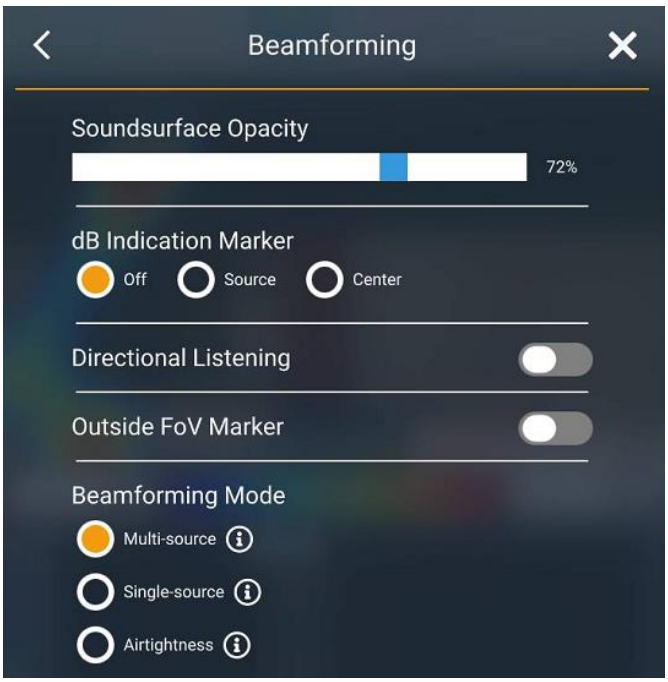
4.6.8 Acoustic settings

Tap

to adjust the acoustic settings for ‘Beamforming’, ‘Spectrum’, ‘NTi Microphones’ and ‘Palettes’.



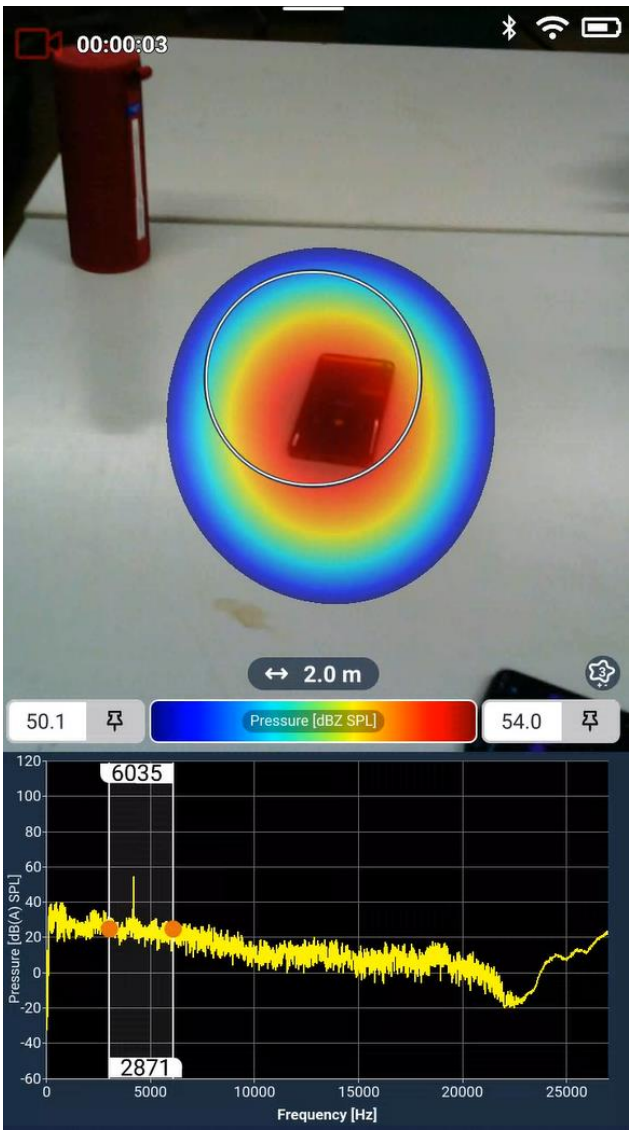
Beamforming Select ‘Beamforming’ to change settings related to the beamforming soundsurface, such as ‘Soundsurface Opacity’, ‘dB Indication Marker’, ‘Directional Listening’, ‘Outside FoV Marker’ and ‘Beamforming Mode’.



Soundsurface opacity Change the opacity of the Soundsurface overlay on the video image with the slider.

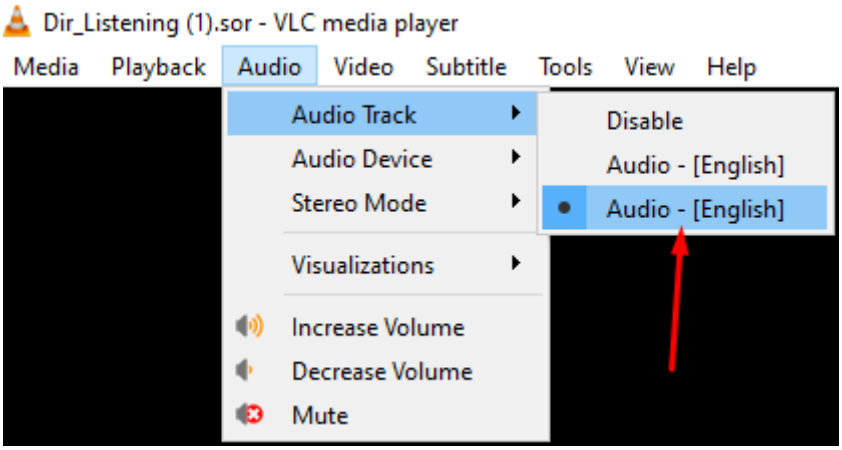
dB indicator Marker A dB marker will show the sound pressure level of the marker's location within the selected frequency selection. The marker can be located at the center or can automatically be located on the most dominant source within the FoV.

Directional Listening A circle will be displayed on the screen which will enhance sound that is measured within the circle and attenuate any sound present outside of the circle. Connecting Bluetooth headphones to the Sorama CAM iV64 gives you to opportunity to listen live to the sounds that are present within the Directional Listening circle, while it weakens other sounds. This feature was made to be able to get directional information on the sound you identified on your Sorama CAM iV64 and would isolate it from any other sounds in the environment.

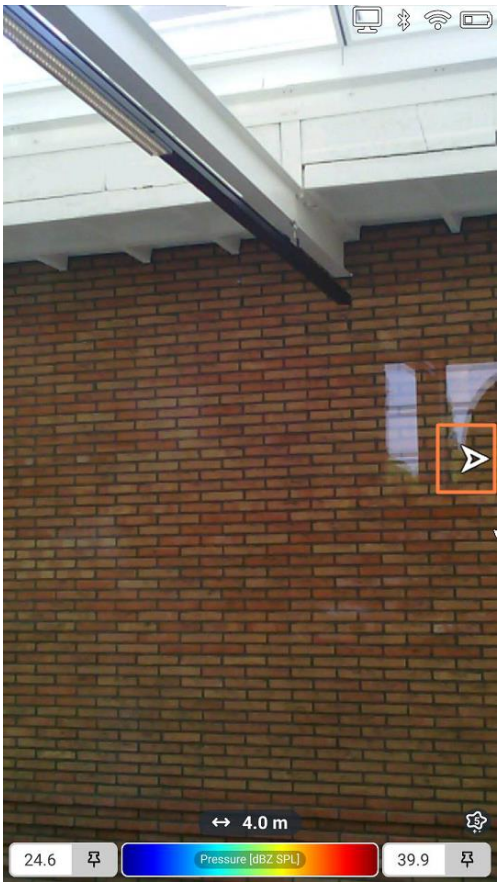


The sounds within the circle can be listened to while performing real-time activities on the Sorama CAM iV64. However, when making a recording with the Sorama CAM iV64, the same directional sound information can be listened back when opening the .sor file of the measurement in VLC media player and/or opening the .webm file of the measurement in any media player. Opening the .webm

file in any media player will directly give you access to the Directional Listening information, however when opening the .sor file in VLC media player you need to perform an extra action. When opening VLC media player change the audio path at Audio > Audio Track > Audio - [English]. Make sure you click on the bottom 'Audio - [English]' to be able to listen back to the Directional Listening information.



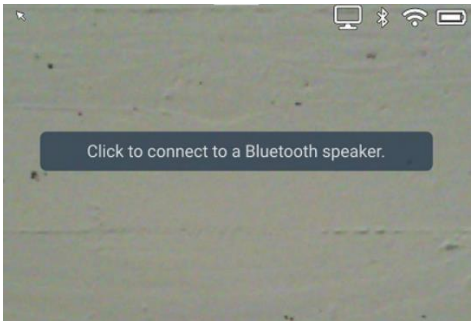
Outside FoV Marker This marker will show up on the edges of the screen when your CAM iV64 measures a source present which is outside of the standard FoV. This feature is useful when you are looking for sources with unknown locations.



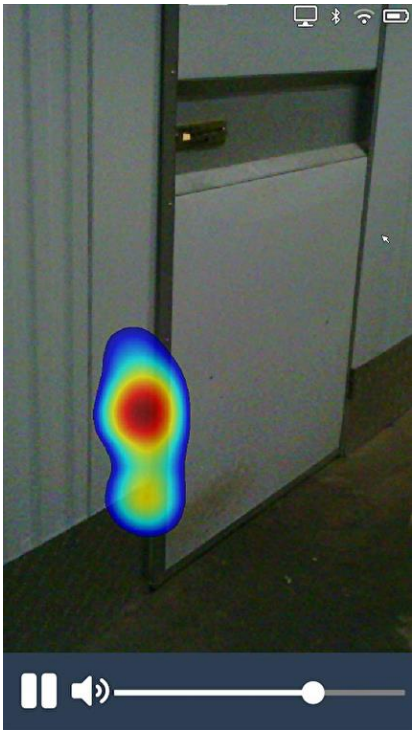
Beamforming Mode Choose between different beamforming options, including Multi-source, Single-source and Airtightness. Be aware that the Airtightness mode is a licensed feature and is therefore disabled in the standard purchase of the CAM iV64.

Whenever having purchased the Airtightness Beamforming Mode License, by default the user view will be simplified for straightforward leak detection. This mode gives users quick insights into leak detection without having to make, for example, a frequency range selection or a distance setting for the beamforming. Furthermore, when using this feature, the CAM iV64 will play a suitable signal through a connected Bluetooth speaker.

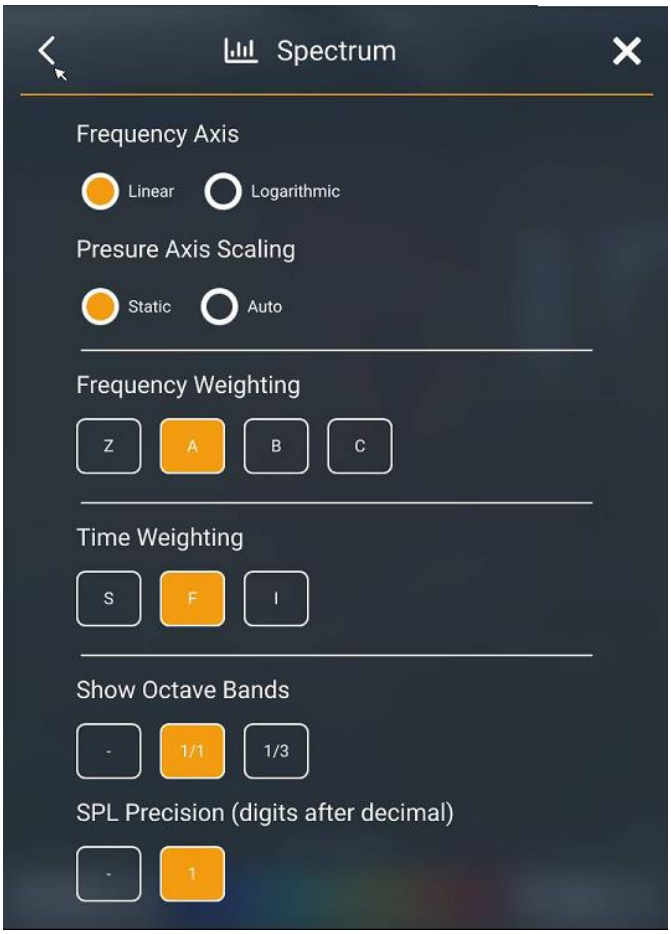
To use the Airtightness Beamforming Mode, press the 'Click to connect to a Bluetooth speaker' button. From this screen you will be guided to the Bluetooth screen, in which you can make a connection to your already switched on Bluetooth speaker.



Upon closing the Bluetooth screen, down below a 'Play' button appears alongside a 'Volume' bar. In this panel the Bluetooth speaker can be switched on and switched off. Also, the volume of the speaker can be controlled by dragging the white dot over the 'Volume' bar. Move the CAM iV64 in the direction of the building element you would like to inspect to see whether sound is 'leaking' through the parts of the building element.

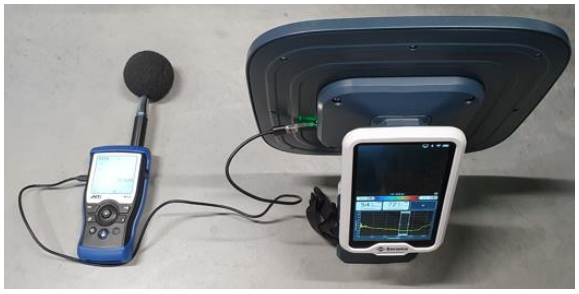


Spectrum Select ‘Spectrum’ to adjust the settings related to the frequency spectrum, such as ‘Frequency Axis’, ‘Pressure Axis Scaling’, ‘Frequency Weighting’, ‘Time Weighting’, ‘Octave Bands’ and ‘SPL Precision’. To understand more about the choices of the settings, please refer to paragraph §4.3.



NTi Microphones Select ‘NTi Micrhopones’ to be able to perform measurements of Sound Levels using the SLM feature as measured by a connected NTi sound level meter (for more information about the SLM, please refer to paragraph 4.6.4).

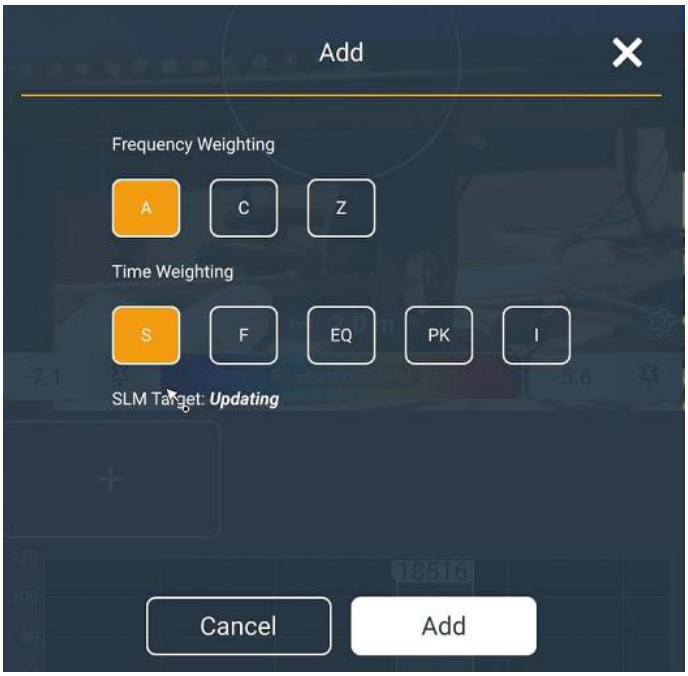
First, connect a NTi sound level meter (that is switched on) to the CAM iV64 (that is also switched on) using the micro-USB to USB-A cable (that comes with the NTi sound level meter) and a female USB-A to male USB-C converter. The CAM iV64 supports the connection to the NTi XL2 and the NTi XL3.



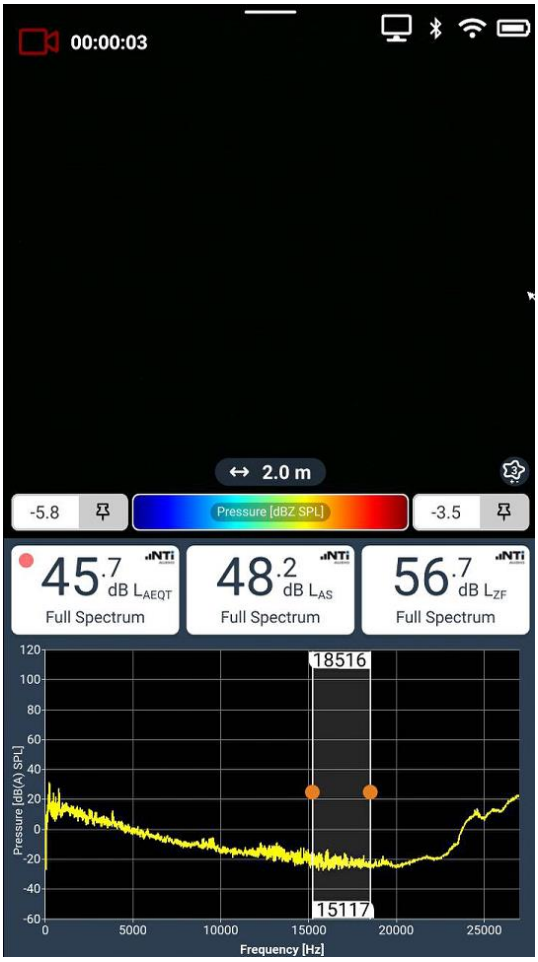
Select on the CAM iV64 to which NTi sound level meter you would like to connect the CAM iV64.

Open the SLM Mode and press on the '+' button.

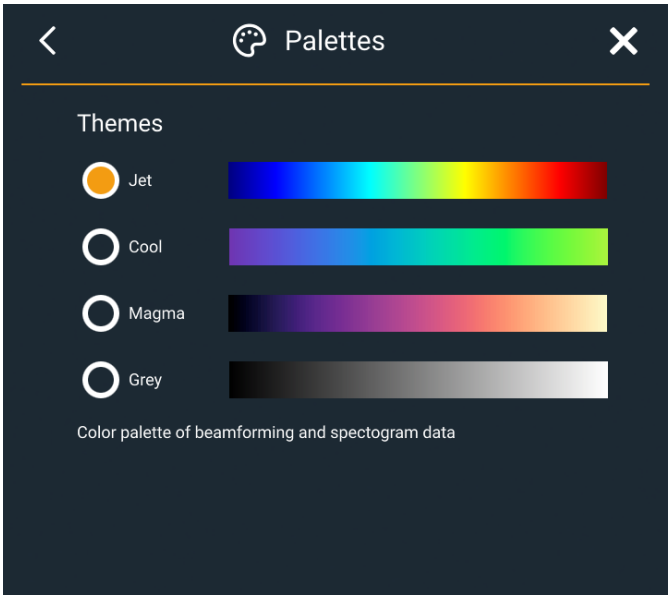
Choose which Frequency Weighting and Time Weighting you would like to apply to the measurement.

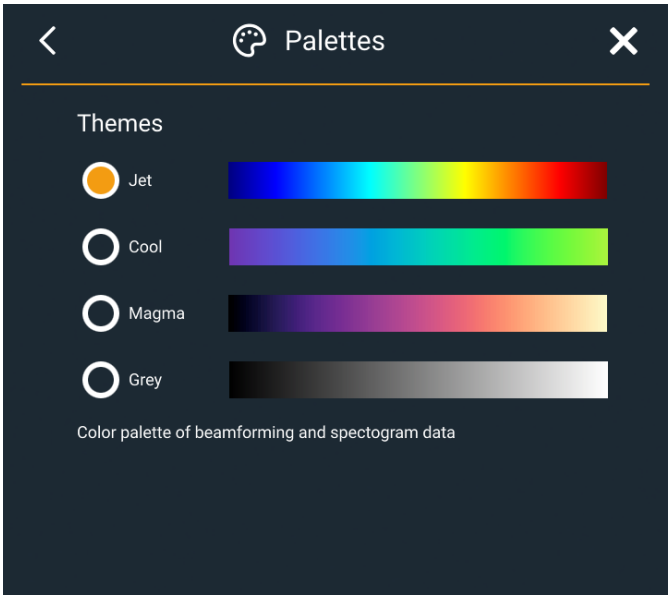


On the top right in the SLM tile, the NTi logo is displayed, showing that the sound levels shown are the levels that are measured by the connected NTi sound level meter and not by the CAM iV64. Similar measurements can be performed as when selecting the CAM iV64's SLM, however now it will store the sound levels as measured by the connected NTi sound level meter.



Pallettes Choose the colors of the SoundSurface. You can choose between “Jet”, “Cool”, “Magma” and “Grey”.





4.6.9 Special measurements

The CAM iV64 contains special measurement workflows that will support the user to perform measurements according to NEN/ISO standards (EU) and ASTM standards (USA). These include workflows for the Sound Reduction Index, the Reverberation Time (EU and USA version), the Speech Level Reduction and the Sound Transmission Class. These special measurement workflows are paid features.

4.6.9.1 SOUND REDUCTION INDEX

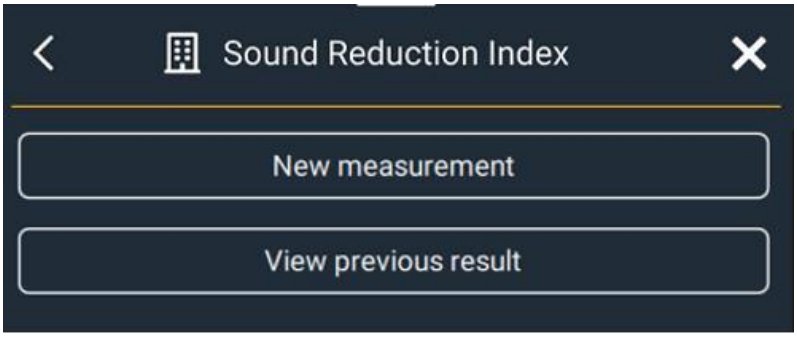
The CAM iV64 contains a special measurement workflow for the Sound Reduction Index measurements. To select the format, first reveal the drop-down menu, by swiping down from the top.

Step 1: Tap

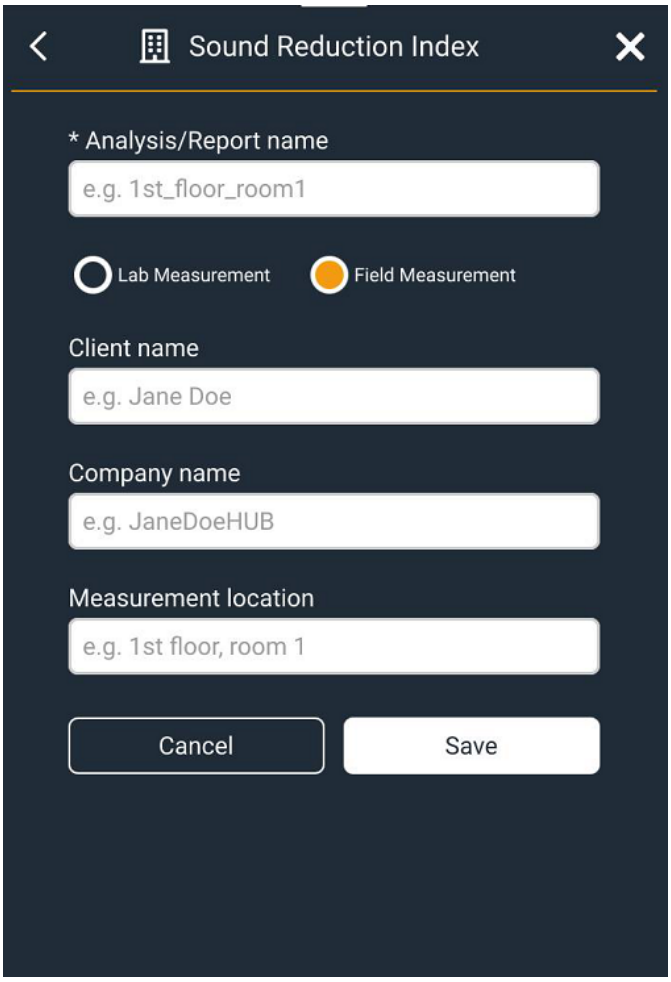
to reveal the special measurements format.

Step 2: Select the Sound Reduction Index.

Step 3: Make a 'New measurement' or load results from an existing measurement in 'View previous result'.

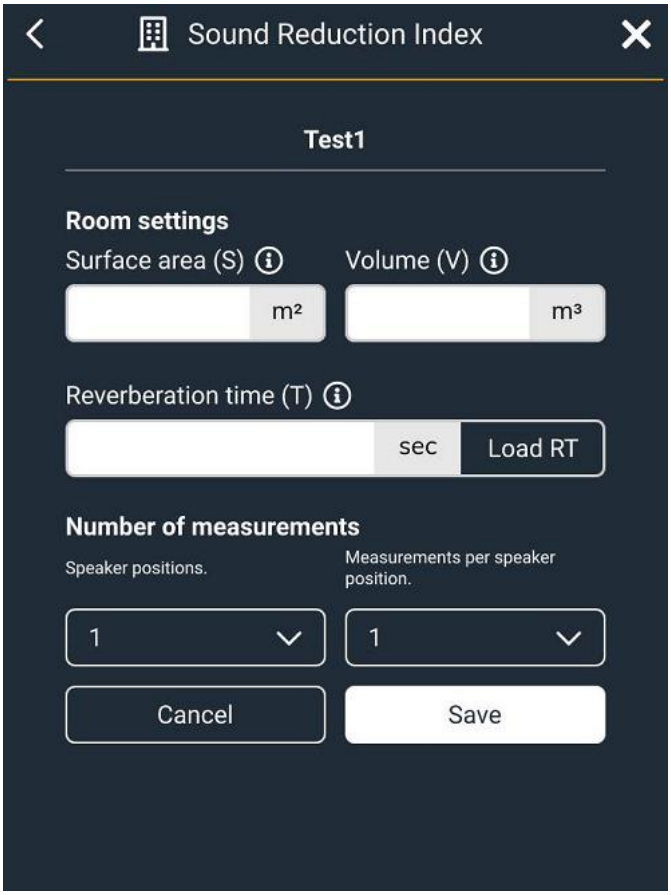


Step 4: When making a new measurement, tap ‘New Measurement’. The following screen will be displayed.

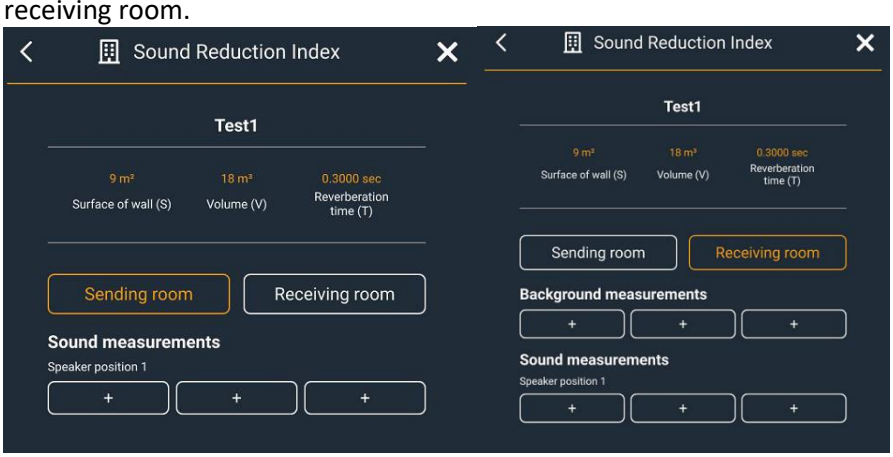


Create a project by entering the ‘Analysis/Report name’ and by choosing a measurement type. If ‘Lab measurement’ is chosen, the sound reduction index is denoted by R and if ‘Field measurement’ is chosen, the same index is denoted by R'. For further report purposes you can also input the ‘Client name’, the ‘Company name’ and the ‘Measurement location’. Tap on ‘Save’ to save the measurement or press ‘Cancel’ to stop.

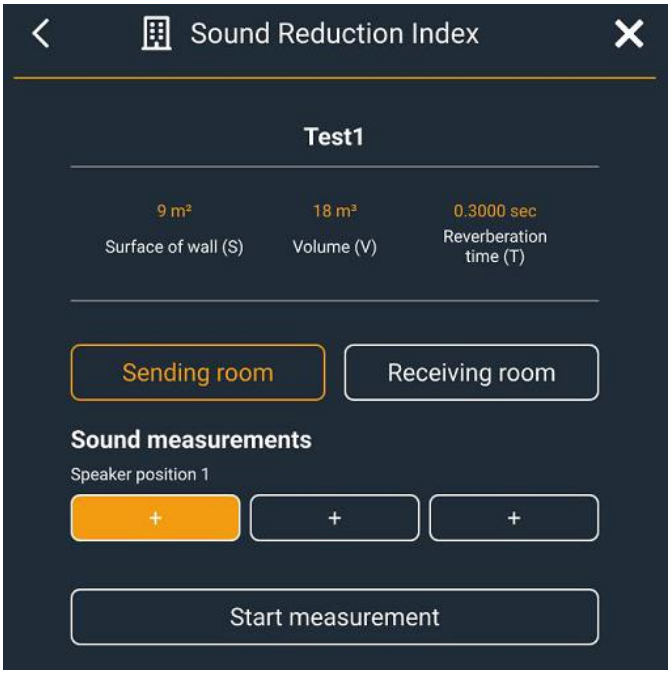
Step 5: Input the room dimensions, the reverberation time, the number of speaker positions and the number of measurements per speaker position.
The next screen shows the input project name at the top, in this case, ‘Test1’.



Step 6: Perform measurements in the source room and receiving room.
The total number of measurements depends on the number of speaker positions and the number of measurements per speaker position you have given as input. As an example, we have selected 1 speaker position and 3 measurements per speaker position. This would give us 9 measurements in total, including 3 measurements to be performed for speaker position 1 in the sending room, 3 background measurements in the receiving room and 3 measurements for speaker position 1 in the receiving room.

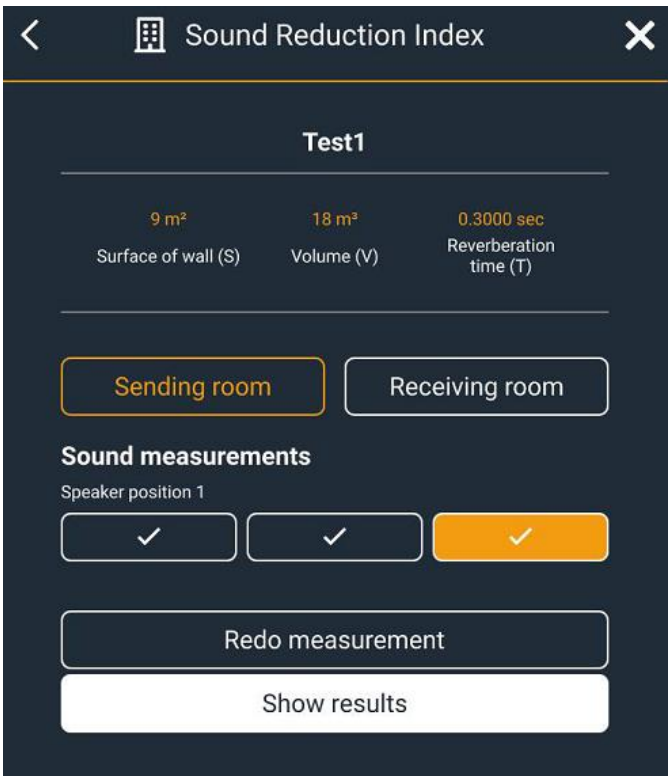


When one of the boxes is tapped, a button ‘Start measurement’ appears at the bottom. Click on ‘Start measurement’ and the sound pressure level in 1/3 octave bands will be measured for 15 seconds and saved.

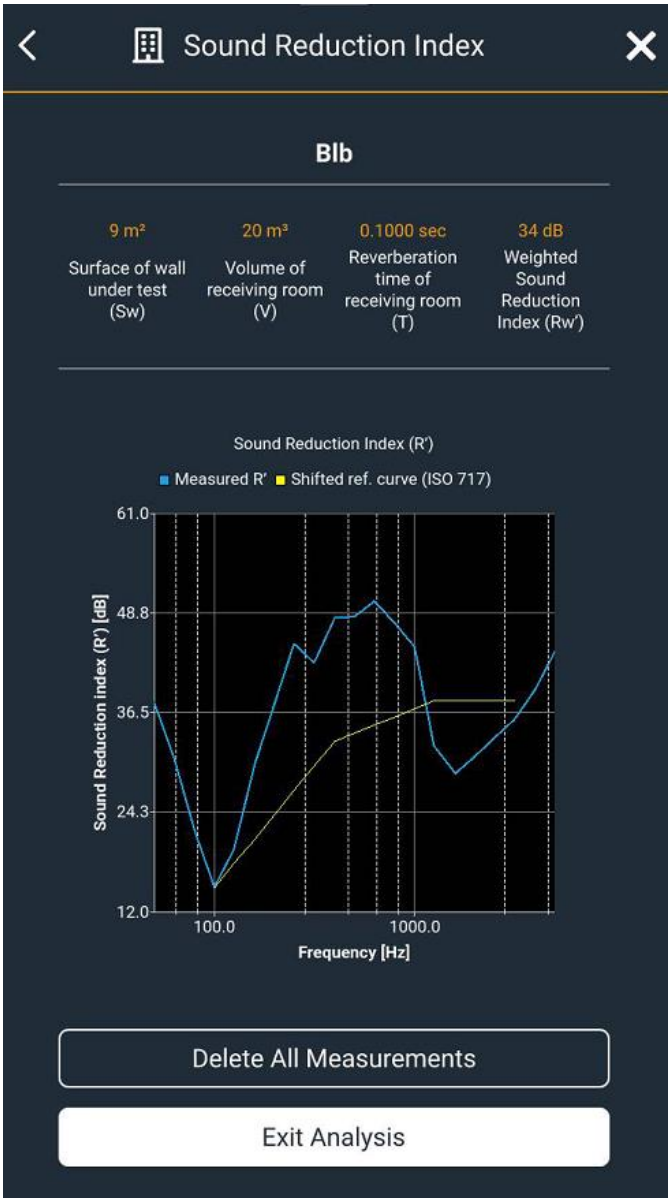


After the measurement is finished, a checkmark appears on the box in place of +. If a measurement is already done, the user can redo the measurement if needed by tapping the box again.

Step 7: View results
After all the measurements have been performed, the button to 'Show results' appears. When the user clicks on this, the results are shown.



Tap on 'Show results' and the results will appear on the screen. An example is shown in the following picture.



View results from a previous measurement

When the user taps on 'View previous result' in step 3, the screen shows all the projects related to sound reduction index. Upon selecting a folder, the results of this measurement will be shown. Previous measurements can be deleted by tapping on the three dots next to the measurement name and thereafter tapping on the 'Delete' button. In the same way, measurements can also be renamed or edited. Viewing previously performed measurements is possible in all special measurement workflows.

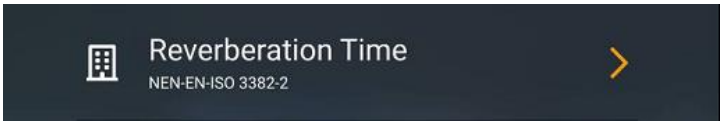
4.6.9.2 REVERBERATION TIME (EU)

The CAM iV64 contains a special measurement workflow for the Reverberation Time measurements. This paragraph describes the special measurement workflow for the Reverberation Time as according to European standards described in NEN-EN-ISO 3382-2. To select the format, first reveal the drop-down menu, by swiping down from the top.

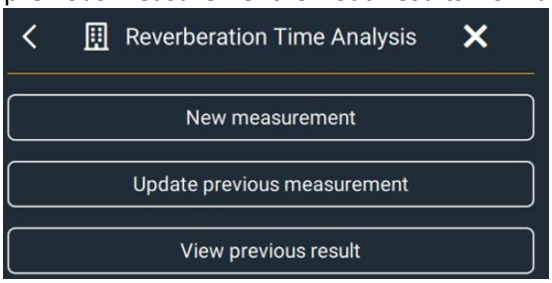
Step 1: Tap

to reveal the special measurements format.

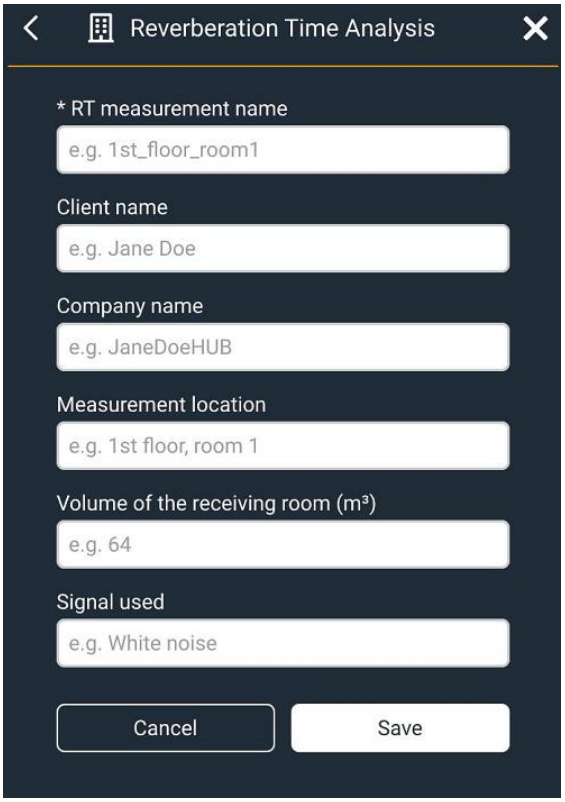
Step 2: Select the Reverberation time.



Step 3: Make a ‘New measurement’, change a previously performed measurement in ’Update previous measurement’ or load results from an existing measurement in ‘View previous result’.



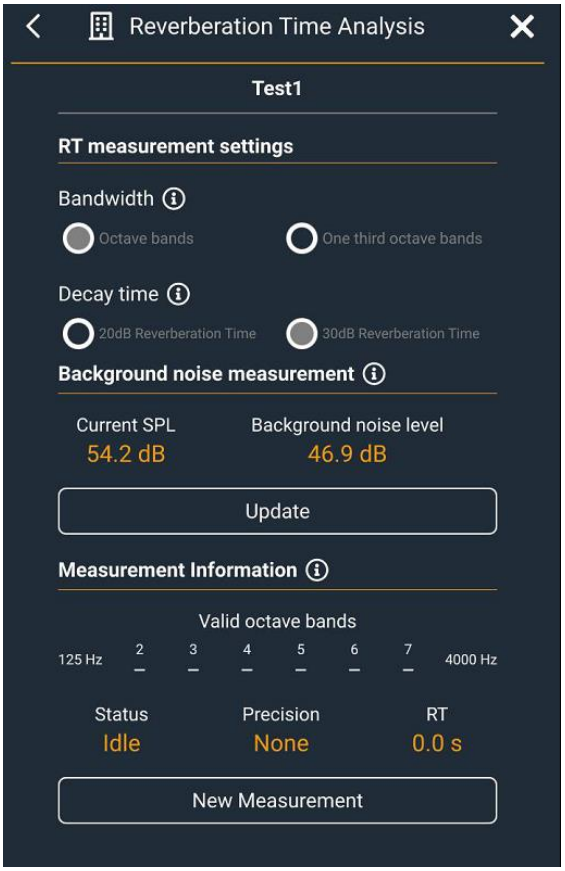
Step 4: When making a new measurement, tap ‘New Measurement’. The following screen will be displayed.



Create a project by entering the ‘RT measurement name’. For further report purposes you can also input the ‘Client name’, the ‘Company name’, the ‘Measurement location’, the ‘Volume of the receiving room’ and the ‘Signal used’. Tap on ‘Save’ to save the measurement or press ‘Cancel’ to stop.

Step 5: Select whether you want to display the reverberation time measurement results in ‘Octave bands’ or in ‘One third octave bands’, and the decay time in ‘20 dB reverberation Time’ or ‘30 dB Reverberation Time’ by tapping on one of the circles next to the two options. The options can be found below the ‘RT measurement settings’ header. More info about the bandwidth and the decay time selection can be found by clicking the 'info' icon on the device.

Perform a background noise measurement by tapping on the ‘Measure’ button, which can be found underneath the ‘Background noise measurement’ header. The background noise measurement can be performed more than once. Whenever you have performed a background noise measurement and afterwards tap on ‘Update’, an average ‘Background noise level’ of the two performed measurements will be displayed. The ‘Current SPL’ will always display the sound pressure level of each individual background noise measurement. Make sure you perform the background noise measurement in a situation which represents the room under test in the best way possible. This means that the presence of any other external sound sources should be avoided (e.g. music, speaking, cars passing by, construction noise and other transient events).



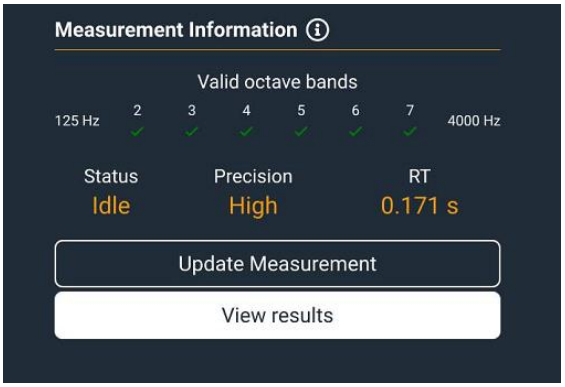
Subsequently, the reverberation time measurements can be performed. A measurement can be started by tapping on the 'New Measurement' button, which can be found on the bottom of the screen. Since the Reverberation Time feature on the CAM iV64 is designed to function according to the interrupted noise method (i.e. a steady state broadband noise that is suddenly stopped), the 'New Measurement' button should be pressed when the sound source is already switched on and playing the sound signal chosen for the reverberation time measurement. We advise to use an omni-directional speaker playing a broadband noise, such as white noise or pink noise.

After pressing the 'New Measurement' button, the 'Status' indicates whether a reverberation time measurement is active or not. There are three different conditions for the 'Status', namely: Idle, Armed and Active. The 'Idle' is displayed on the screen when the sound signal measured is not high enough above the previously performed background noise measurement. The 'Status' changes from 'Idle' to 'Armed' when the measured sound signal is high enough above the background noise. Thereafter, the CAM iV64 will detect whether there is a decay present after switching off the sound source, during which the 'Active' condition is reached. When a long enough decay is measured to comply to the 'Decay Time' of 20 dB or of 30 dB (depending on the selected 'Decay Time'), the reverberation time measurement will be completed after which its 'Status' changes back to 'Idle'.

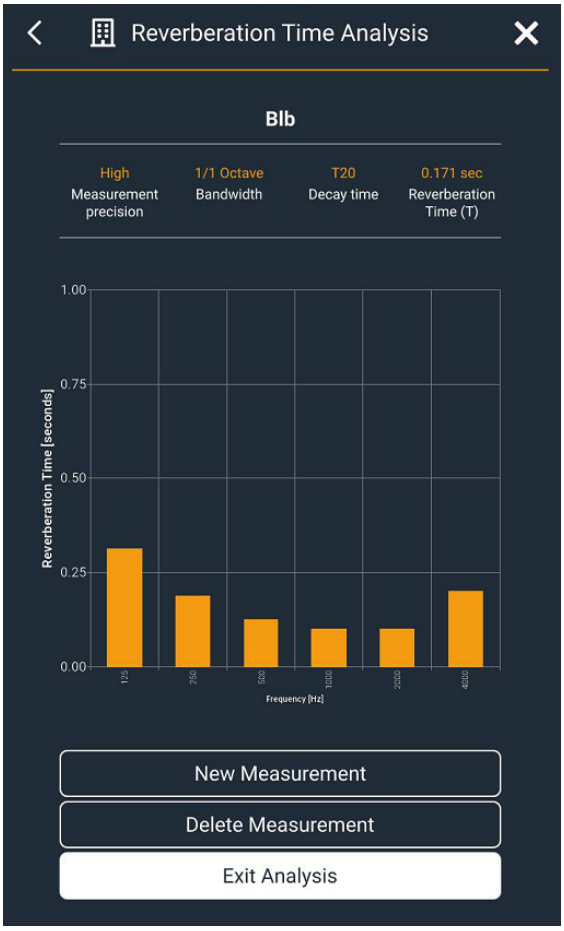
When starting a reverberation time measurement, the 'New Measurement' button changes to the 'Measuring…' button, indicating the CAM iV64 is checking whether the introduced sound is high enough above the previously measured background noise.

Like background noise measurements, the reverberation time measurement can also be performed more than once. Whenever you have performed a reverberation time measurement and afterwards tap on 'Update measurement', an average 'Reverberation Time RT' of the two performed measurements will be displayed.

The ‘Status’ indicates whether a reverberation time measurement is active or not.
The ‘Precision’ indicates the precision of the reverberation time measurement(s) performed. Performing more reverberation time measurements will increase the precision.



Step 6: View results
After the desired number of reverberation time measurements have been performed, you can tap on the ‘view results' button. When the user clicks on this, the results are shown.



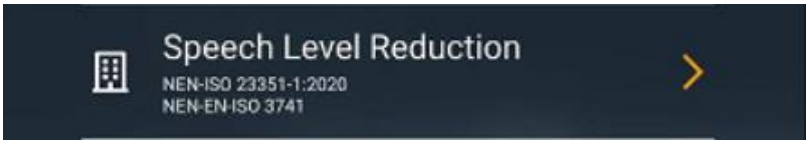
4.6.9.3 SPEECH LEVEL REDUCTION

The CAM iV64 contains a special measurement workflow for the Speech Level Reduction measurements. To select the format, first reveal the drop-down menu, by swiping down from the top.

Step 1: Tap

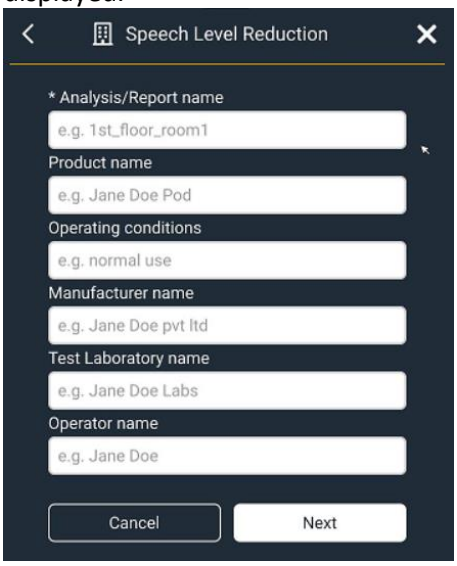
to reveal the special measurements format.

Step 2: Select the Speech Level Reduction.



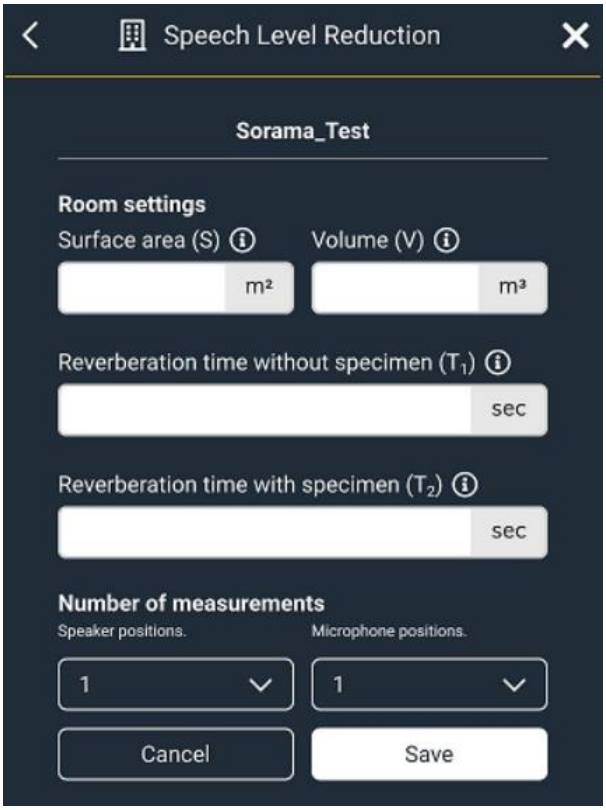
Step 3: Make a 'New measurement' or load results from an existing measurement in 'View previous result'.

Step 4: When making a new measurement, tap 'New Measurement'. The following screen will be displayed.



Create a project by entering the 'Analysis/Report name'. For report purposes you can also input the 'Product name', the 'Operating conditions', the 'Manufacturer name', the 'Test Laboratory name' and the 'Operator name'. Tap on 'Next' to proceed to the measurement setting or press 'Cancel' to stop.

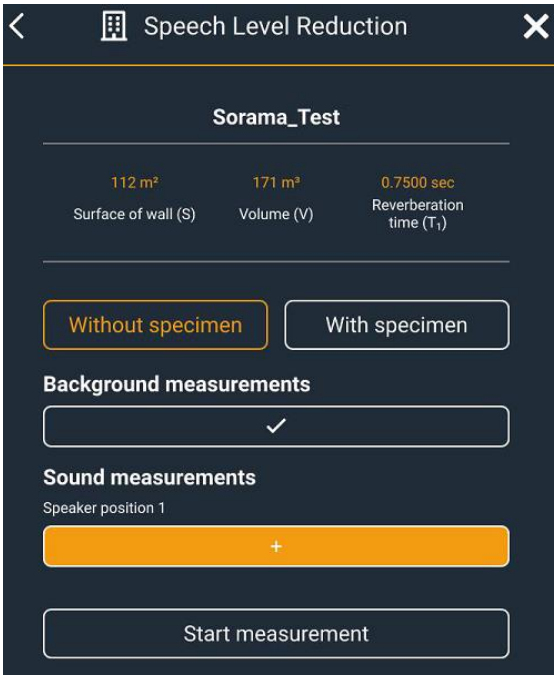
Step 5: Input for the room settings and the number of measurements for speaker and microphone positions needed. The next screen shows the input project name at the top, in this case, 'Sorama_Test'. For the reverberation time measurement please refer to paragraph §4.6.9.2. The number of speaker positions depends on the participants that could fit in the specimen.



Surface area (S):
Total surface area S of the test room in m^2
Volume (V):
Volume of the test room V in m^3
Reverberation time without specimen (T_1):
The reverberation time T_{60} of the test room without specimen in s.
Reverberation time with specimen (T_2):
The reverberation time T_{60} of the test room with specimen in s.
Speaker/Microphone positions:
Amount of speaker positions and microphone positions needed for the measurement.

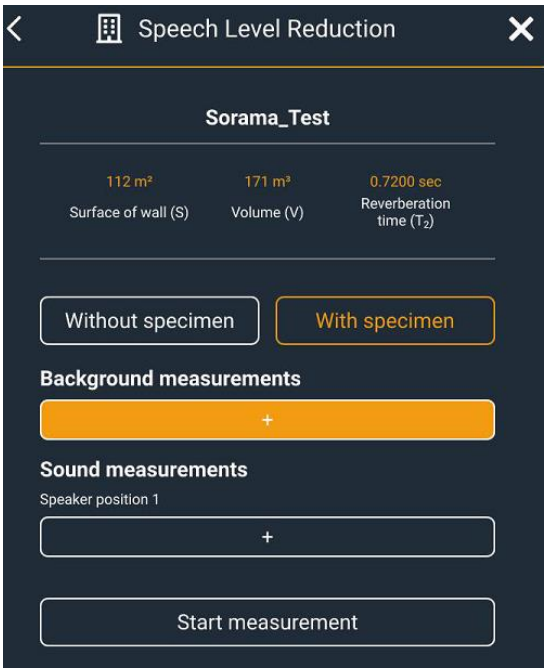
Step 6: Determine the sound power level of the reference box without specimen in the test room. First tap on '+' and 'start measurement' to measure the background noise in the test room for every microphone position selected. A 10 second measurement in one third octave bands from 100 Hz to 10000 Hz is performed each time. The same process will follow for the sound measurement, however this time with a sound source switched on at the location where an occupant would be within the specimen.

Please note the sound measurement must be measured directly before or after the background noise measurement.



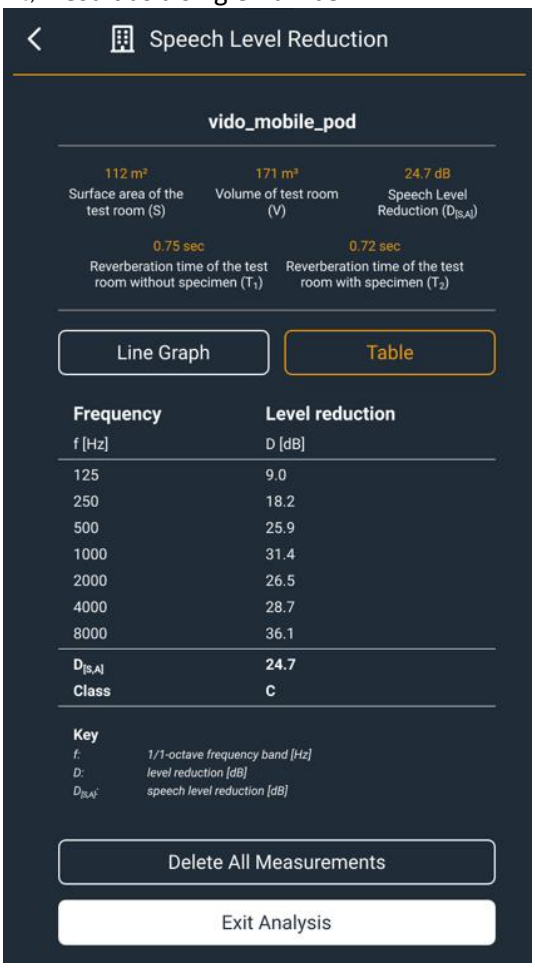
Step 7: Determine the sound power level of the reference box with specimen in the test room. Tap on '+' and 'start measurement' to start measuring the background noise in the test room for every microphone position selected. A 10 second measurement in one third octave bands from 100 Hz to 10000 Hz is performed each time. The same process will follow for the sound measurement, however this time with a sound source switched on at the location where an occupant would be within the specimen.

Please note the sound measurement must be measured directly before or after the background noise measurement.



Step 8: View the results. After all the measurements have been performed, the button 'Show results' appears. When you click on this button, a graph with the Level Reduction D results can be found in 'Line Graph'. Numerical results of the Level Reduction D and reduction classification can be found in

'Table' section. Both the 'Line Graph' and the 'Table' section will show the Speech Level Reduction $D_{S,A}$ result as a single number.



D = level reduction
The level reduction is the difference between the sound power levels measured without and with specimen. This level reduction is calculated and reported in 1/1 octave frequency bands from 125 Hz to 8000 Hz and is Z-weighted.

$D_{S,A}$ = A-weighted Speech Level Reduction.

Class = Classification of enclosures according to the Speech Level Reduction, $D_{S,A}$

For details of the determinations please refer to the norms, NEN-ISO 23351-1:2020 and NEN-EN-ISO 3741.

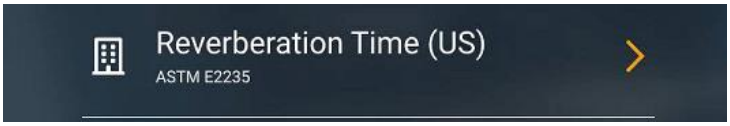
4.6.9.4 REVERBERATION TIME (US)

The CAM iV64 contains a special measurement workflow for the Reverberation Time measurements. This paragraph describes the special measurement workflow for the Reverberation Time as according to USA standards described in ASTM E2235. To select the format, first reveal the drop-down menu, by swiping down from the top.

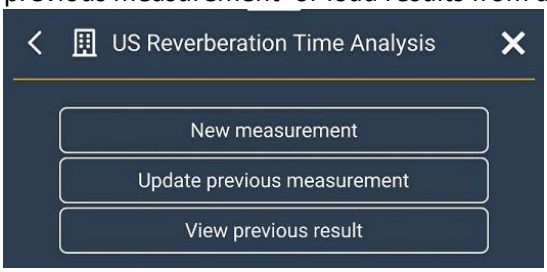
Step 1: Tap

to reveal the special measurements format.

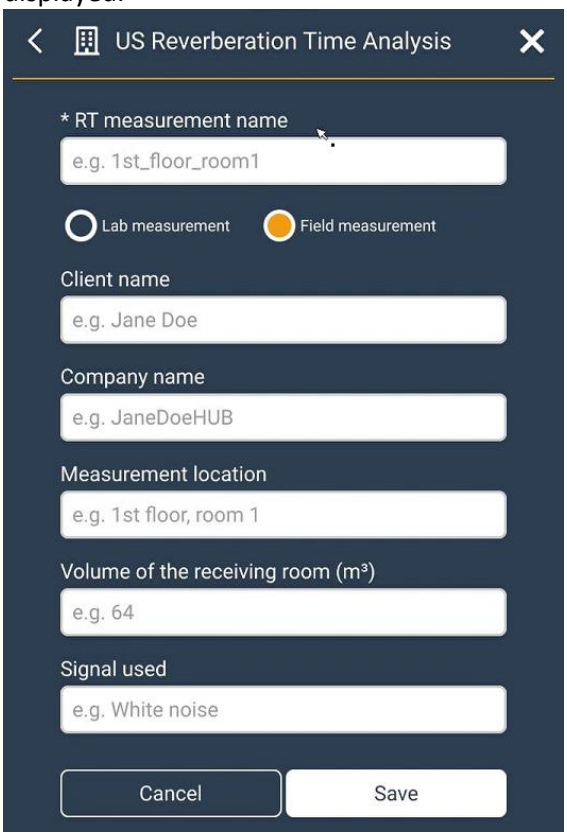
Step 2: Select the Reverberation time.

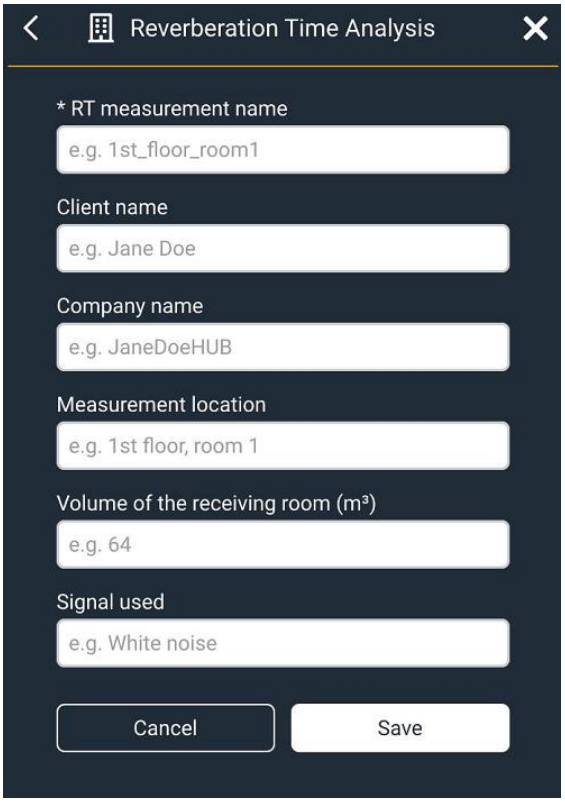


Step 3: Make a 'New measurement', change a previously performed measurement in 'Update previous measurement' or load results from an existing measurement in 'View previous result'.



Step 4: When making a new measurement, tap 'New Measurement'. The following screen will be displayed.

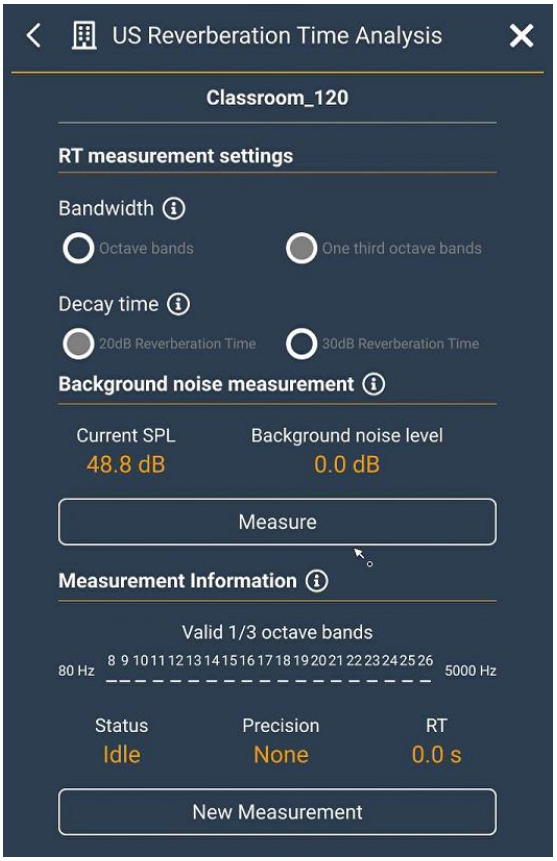




Create a project by entering the 'RT measurement name' and specify whether you are performing a Lab measurement or a Field measurement. When selecting a Lab measurement, the reverberation time measurement will be performed in 1/3 octave bands with a decay time T_{30}. When selecting a Field measurement, the reverberation time measurement will be performed in 1/3 octave bands with a decay time T_{20}.

For further report purposes you can also input the 'Client name', the 'Company name', the 'Measurement location', the 'Volume of the receiving room' and the 'Signal used'. Tap on 'Save' to save the measurement or press 'Cancel' to stop.

Step 5: Perform a background noise measurement by tapping on the 'Measure' button, which can be found underneath the 'Background noise measurement' header. The background noise measurement can be performed more than once. Whenever you have performed a background noise measurement and afterwards tap on 'Update', an average 'Background noise level' of the two performed measurements will be displayed. The 'Current SPL' will always display the sound pressure level of each individual background noise measurement. Make sure you perform the background noise measurement in a situation which represents the room under test in the best way possible. This means that the presence of any other external sound sources should be avoided (e.g. music, speaking, cars passing by, construction noise and other transient events).



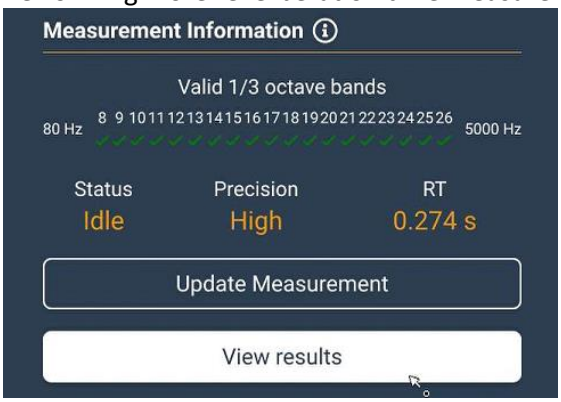
Subsequently, the reverberation time measurements can be performed. A measurement can be started by tapping on the 'New Measurement' button, which can be found on the bottom of the screen. Since the Reverberation Time feature on the CAM iV64 is designed to function according to the interrupted noise method (i.e. a steady state broadband noise that is suddenly stopped), the 'New Measurement' button should be pressed when the sound source is already switched on and playing the sound signal chosen for the reverberation time measurement. We advise to use an omni-directional speaker playing a broadband noise, such as white noise or pink noise.

After pressing the 'New Measurement' button, the 'Status' indicates whether a reverberation time measurement is active or not. There are three different conditions for the 'Status', namely: Idle, Armed and Active. The 'Idle' is displayed on the screen when the sound signal measured is not high enough above the previously performed background noise measurement. The 'Status' changes from 'Idle' to 'Armed' when the measured sound signal is high enough above the background noise. Thereafter, the CAM iV64 will detect whether there is a decay present after switching off the sound source, during which the 'Active' condition is reached. When a long enough decay is measured to comply to the 'Decay Time' of 20 dB or of 30 dB (depending on the selected 'Decay Time'), the reverberation time measurement will be completed after which its 'Status' changes back to 'Idle'.

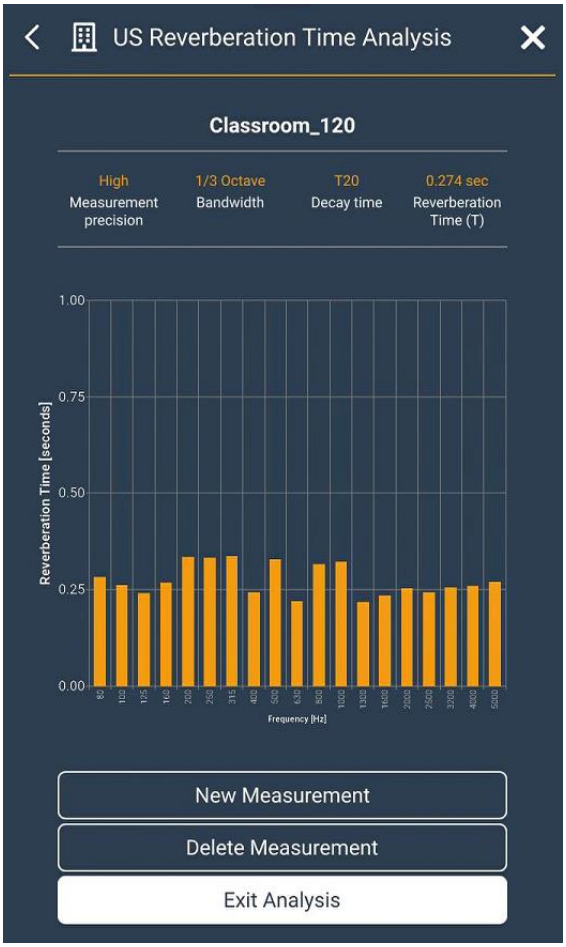
When starting a reverberation time measurement, the 'New Measurement' button changes to the 'Measuring…' button, indicating the CAM iV64 is checking whether the introduced sound is high enough above the previously measured background noise.

Like background noise measurements, the reverberation time measurement can also be performed more than once. Whenever you have performed a reverberation time measurement and afterwards tap on 'Update measurement', an average 'Reverberation Time RT' of the two performed measurements will be displayed.

The ‘Status’ indicates whether a reverberation time measurement is active or not.
The ‘Precision’ indicates the precision of the reverberation time measurement(s) performed. Performing more reverberation time measurements will increase the precision.



Step 6: View results
After the desired number of reverberation time measurements have been performed, you can tap on the ‘view results' button. When the user clicks on this, the results are shown.



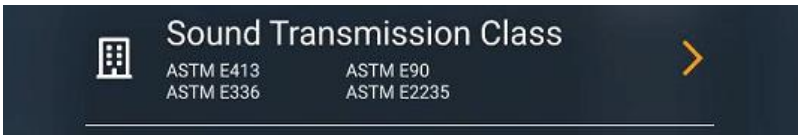
4.6.9.5 SOUND TRANSMISSION CLASS

The CAM iV64 contains a special measurement workflow for the Sound transmission class measurements, which is the USA equivalent of the European Sound reduction index. To select the format, first reveal the drop-down menu, by swiping down from the top.

Step 1: Tap

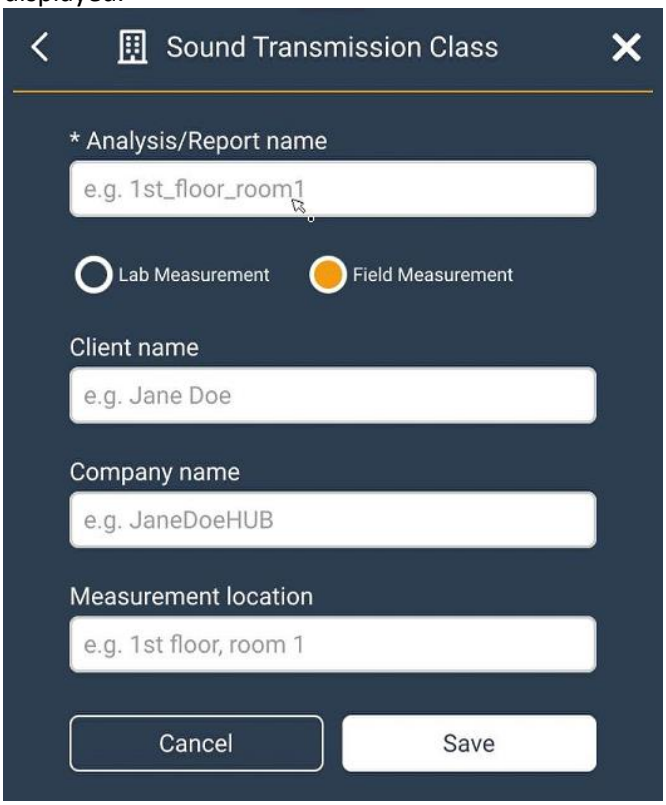
to reveal the special measurements format.

Step 2: Select the Sound Transmission Class.



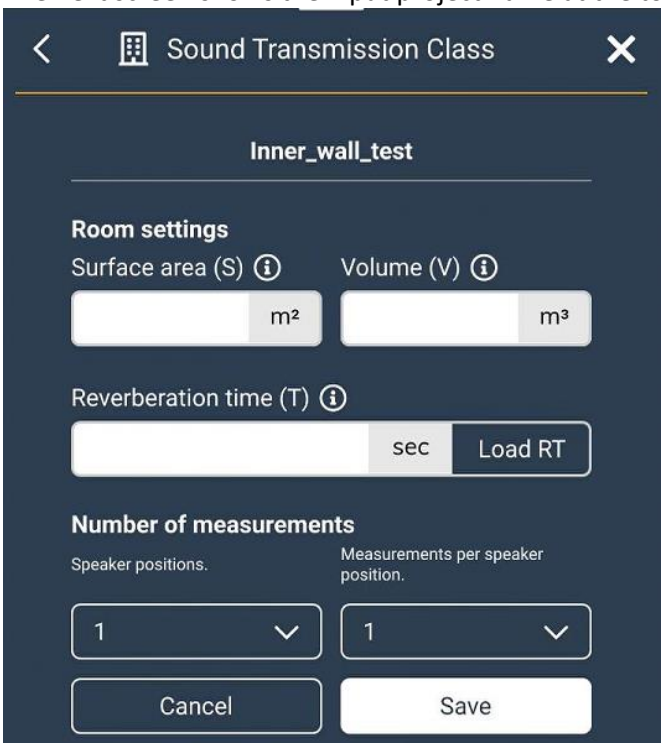
Step 3: Make a 'New measurement' or load results from an existing measurement in 'View previous result'.

Step 4: When making a new measurement, tap 'New Measurement'. The following screen will be displayed.

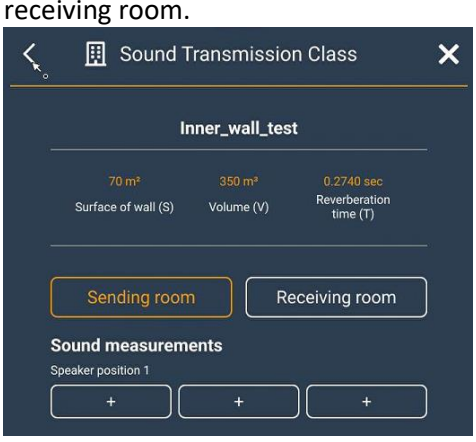


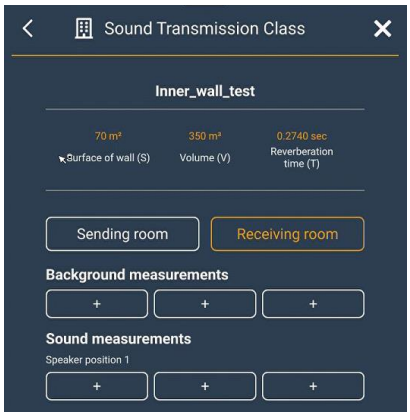
Create a project by entering the 'Analysis/Report name' and by choosing a measurement type. If 'Lab measurement' is chosen, the Sound transmission class is denoted by STC and if 'Field measurement' is chosen, the same index is denoted by ASTC. For further report purposes you can also input the 'Client name', the 'Company name' and the 'Measurement location'. Tap on 'Save' to save the measurement or press 'Cancel' to stop.

Step 5: Input the room dimensions, the reverberation time, the number of speaker positions and the number of measurements per speaker position.
The next screen shows the input project name at the top, in this case, 'Inner_wall_test'.

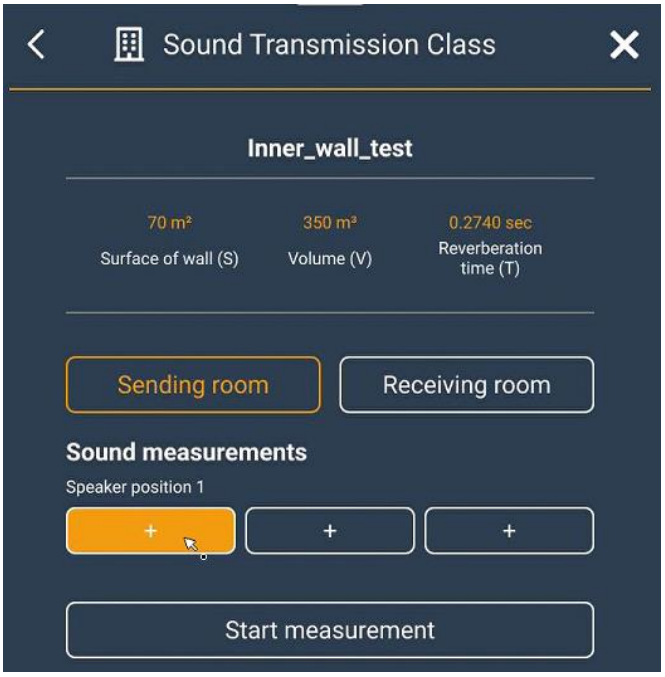


Step 6: Perform measurements in the source room and receiving room.
The total number of measurements depends on the number of speaker positions and the number of measurements per speaker position you have given as input. As an example, we have selected 1 speaker position and 3 measurements per speaker position. This would give us 9 measurements in total, including 3 measurements to be performed for speaker position 1 in the sending room, 3 background measurements in the receiving room and 3 measurements for speaker position 1 in the receiving room.





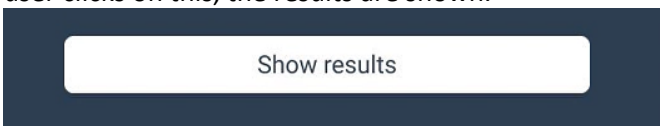
When one of the boxes is tapped, a button 'Start measurement' appears at the bottom. Click on 'Start measurement' and the sound pressure level in 1/3 octave bands will be measured for 10 seconds (for sound measurements in the sending and receiving rooms) or 30 seconds (for background noise measurements in the receiving room).



After the measurement is finished, a checkmark appears on the box in place of +. If a measurement is already done, the user can redo the measurement if needed by tapping the box again.

Step 7: View results

After all the measurements have been performed, the button to 'Show results' appears. When the user clicks on this, the results are shown.



Tap on 'Show results' and the results will appear on the screen. An example is shown in the following picture.

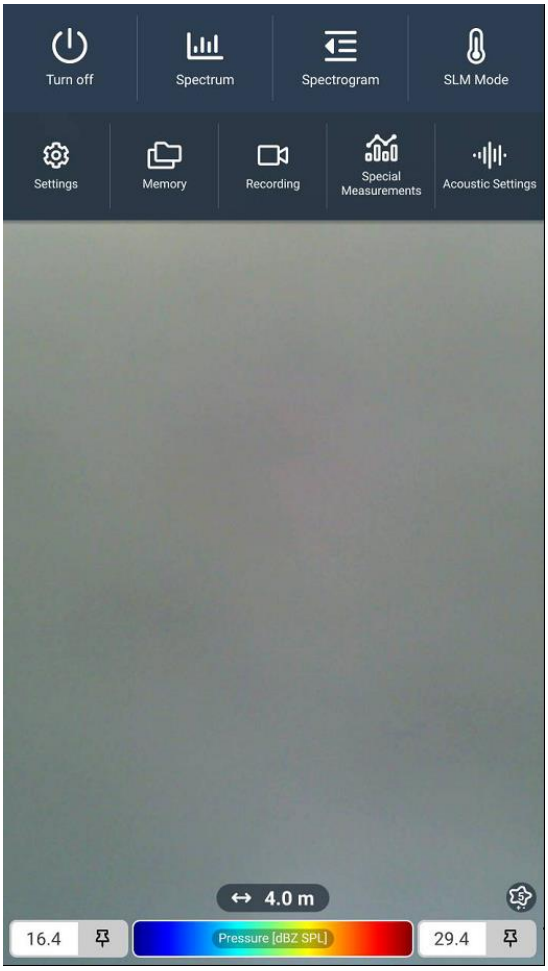
Sound Transmission Class
Inner_wall_test
70 m²
Surface of wall under test (Sw)
350 m³
Volume of receiving room (V)
0.2740 sec
Reverberation time of receiving room (T)
11.00 dB
Apparent Sound Transmission Class (ASTC)
Apparent Transmission Loss (ATL)
Measured ATL
STC Countour
23.0
15.8
8.5
1.3
-6.0
Apparent Transmission Loss (ATL) [dB]
100.0
1000.0
Frequency [Hz]
Delete All Measurements
Exit Analysis

5 Operation

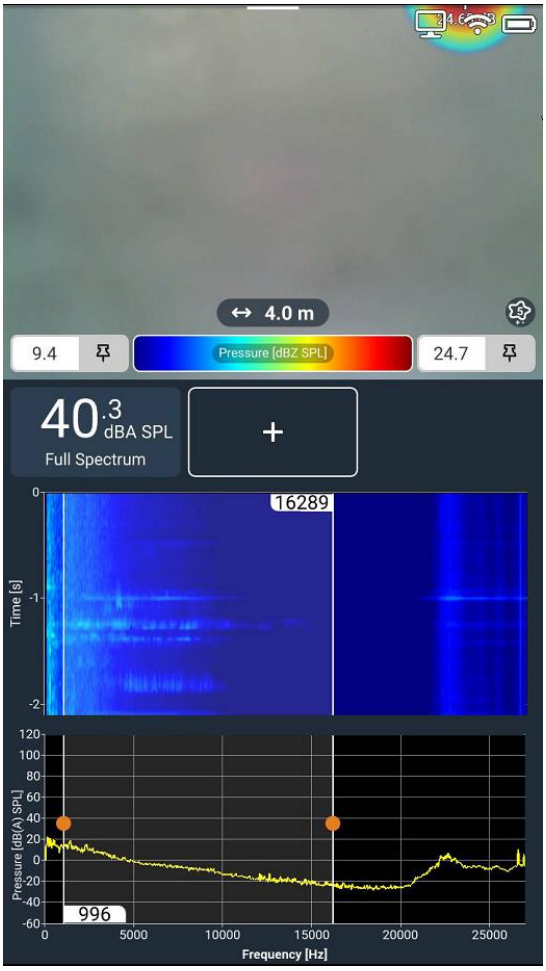
5.1 Basics

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.

To show the menu, swipe down from the top. Tap to activate the spectrum feature.



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 orange dot and drag this dot to the preferred frequency. Execute this for the lower and higher frequency. You can also move the selected frequency band by touching it in the middle and drag it to the preferred area of the spectrum.
If you would like to view the spectrum, spectrogram and SLM mode simultaneously, you can tap the related icons. The spectrum, spectrogram and SLM mode are now visible on the screen.



If you want to perform and store a measurement, please refer to paragraph §4.6.5.

5.2 Mount iV64 on a tripod

⚠ **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.

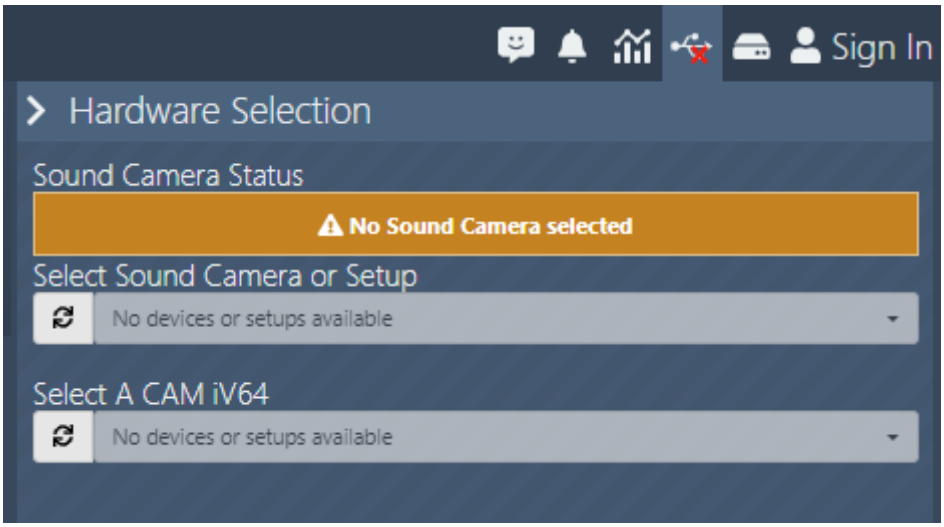
Adjust and secure the legs of the tripod accordingly before mounting the product. Place and mount the tripod under the bottom insert of the product.

5.3 Sorama Portal

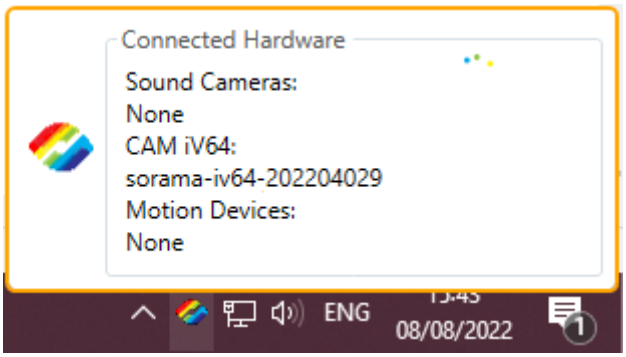
You can upload performed measurements (in .sor format) and special measurement data in the Sorama Portal for in-depth analysis and digital report generation. Be aware that it is not possible to upload screenshots in the .png format or measurements in the .webm format to the Sorama Portal for further analysis, since they do not contain Raw audio data.

When opening the Sorama Portal you will first need to select the Hardware selection icon .

Afterwards you can select your connected CAM iV64 from the dropdown menu.



If you cannot find your CAM iV64 device, you can press the refresh button next to it.
Make sure you have downloaded and installed the latest version of the Sorama Acquisition Client.
When hovering over the Sorama Acquisition Client you can see the connected devices as shown in the example below.



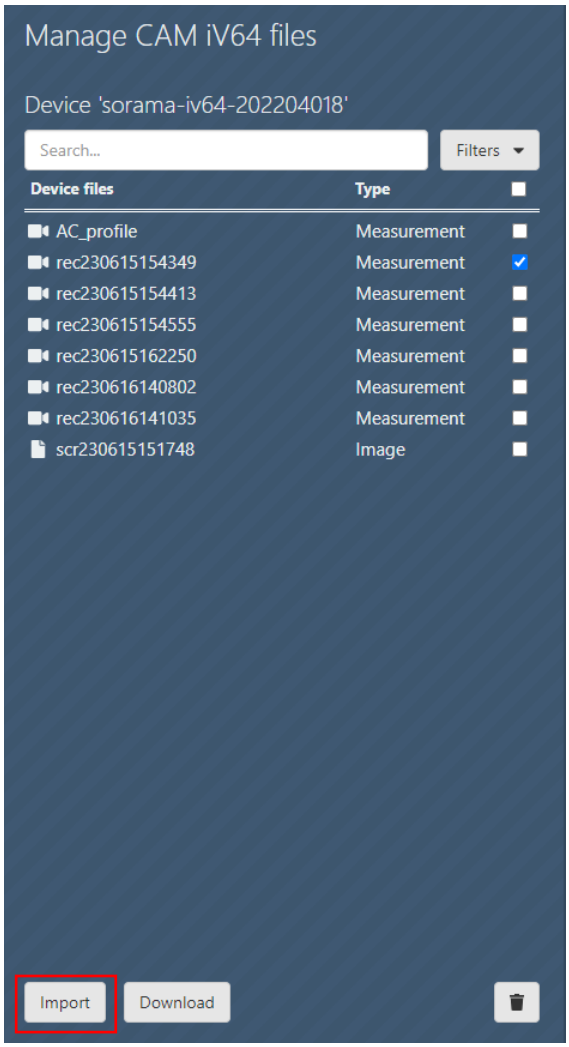
5.3.1 Uploading measurement data to Sorama Portal

Your measurement data can be uploaded to the Sorama Portal. The Sorama Acquisition Client is required to make this happen. The Sorama Acquisition Client can be downloaded from the Sorama Portal.

There are 3 options to upload the data.

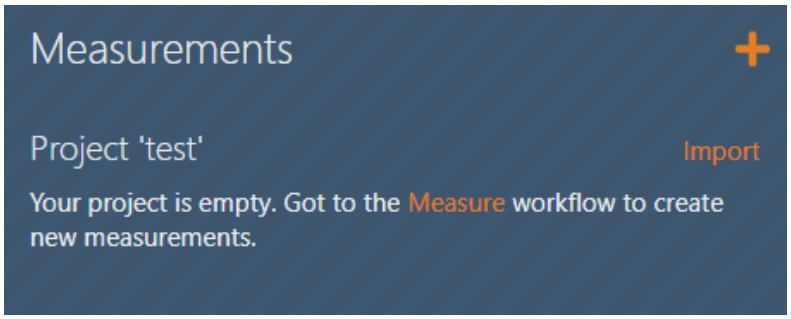
1. Connect your CAM iV64 to your computer with the supplied USB-C cable.

   In the Sorama Portal visit the 'Manage' Manage workflow. If your CAM iV64 is connected properly, you will see a file structure of your recordings. From this view, you can import the measurements directly into your Sorama Portal account by clicking 'Import' button.

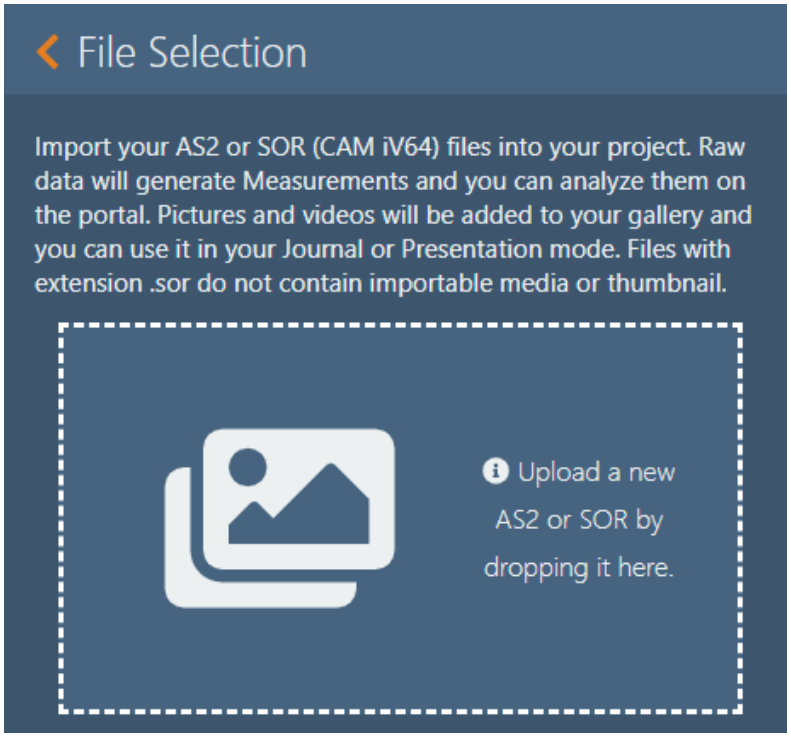


2. Import using an external memory drive. Plug the external drive into the computer on which you are visiting the Sorama Portal. Go to the 'Manage' Manage workflow and click on

the ‘Import’ Import button in the ’Measurements’ section.

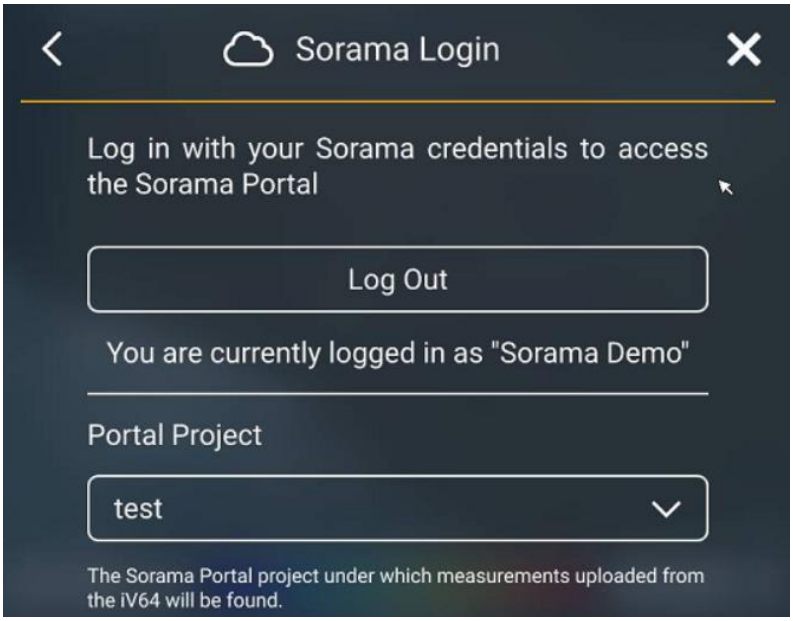


This allows you to drag and drop the .sor files from your external drive into the Sorama Portal.



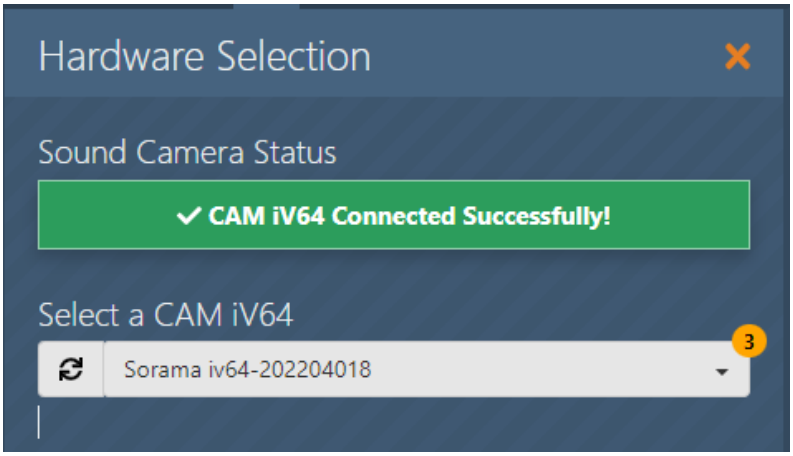
This is especially useful when your data is mainly stored on your external drive.

3. Over the air upload. First, select your destination Portal Project on the CAM iV64 from Settings > Sorama Login > Portal Project.

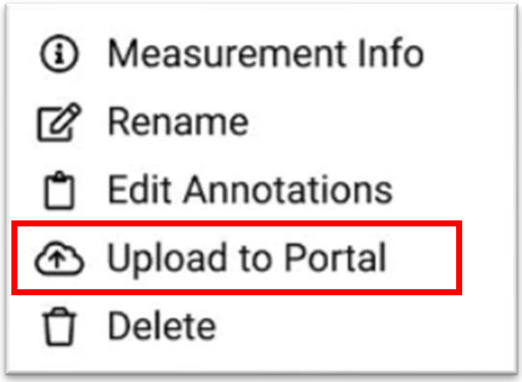


Connect the CAM iV64 to the same internet network as the device that is on Sorama Portal.

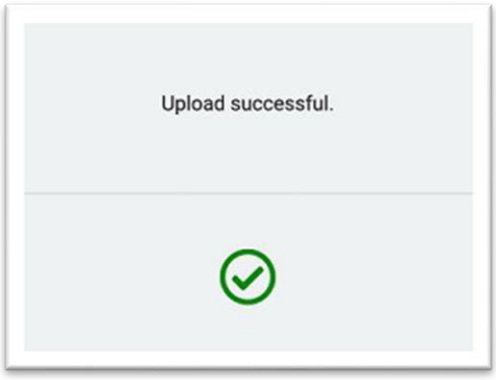
Connect to the CAM iV64 from Sorama Portal > Hardware Selection .



Go to the CAM iV64 Memory menu, tap on the right and click on 'Upload to Portal'.



You can now upload file to your Sorama Portal account straight from Cam iV64 Memory view and find the uploaded data in 'Analyze' section.

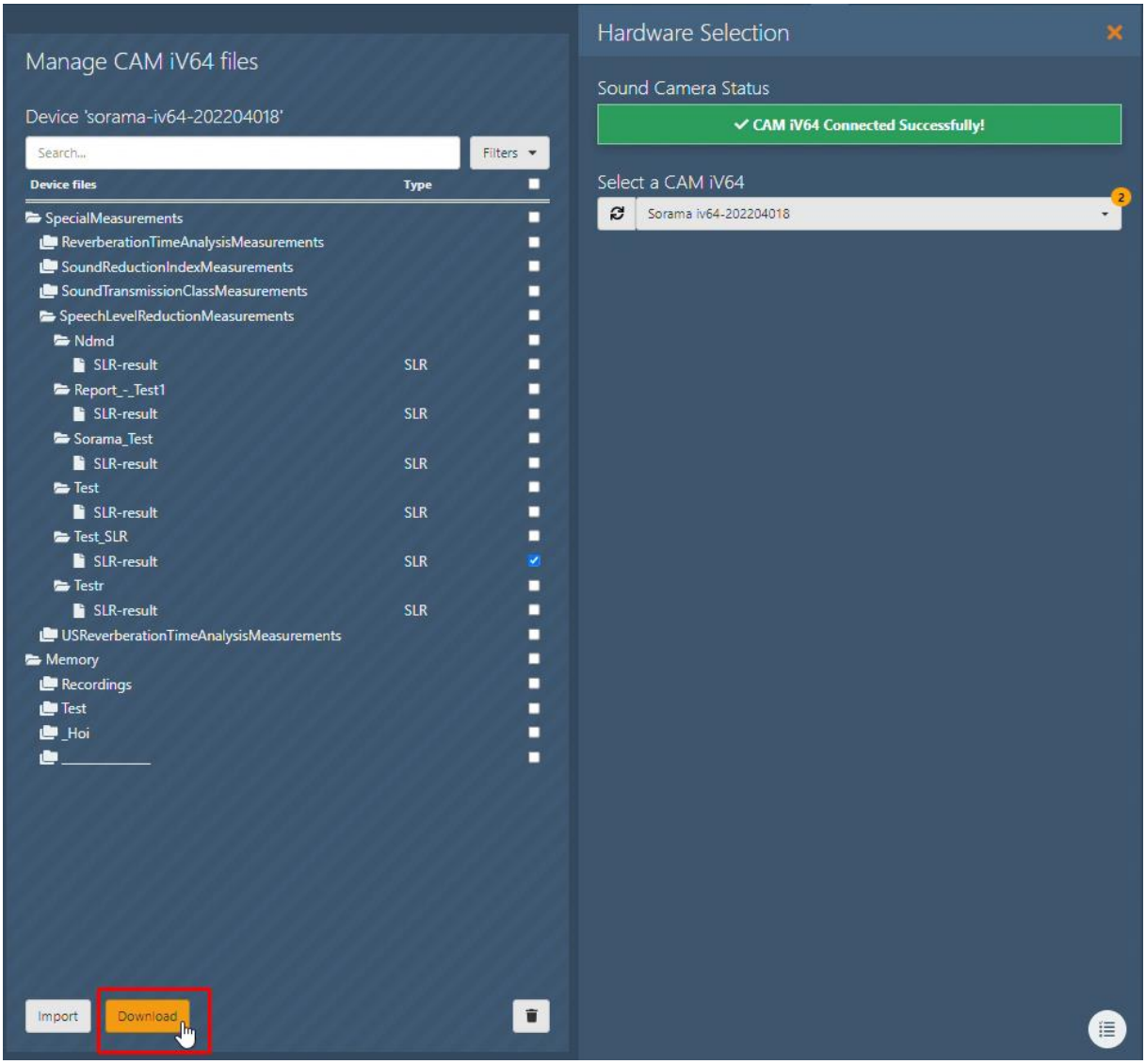


5.3.2 Downloading reports of special measurement workflow measurements

Of every measurement performed in the special measurement workflows of the CAM iV64, a report can be downloaded when connecting the CAM iV64 to the Sorama Portal. This holds for the Sound Reduction Index, the Reverberation Time (EU and USA version), the Speech Level Reduction and the Sound Transmission Class. First, the CAM iV64 needs to be connected to the Sorama Portal, which can be done by connecting the CAM iV64 to your computer with the supplied USB-C cable. Thereafter, the Sorama Portal needs to recognize the CAM iV64, which can be done by downloading the Sorama Acquisition Client when opening the Sorama Portal.

When the CAM iV64 has successfully been connected to the Sorama Portal, go to the 'Manage CAM iV64 files' tab within the Sorama Portal's 'Manage'

workflow. Here you can see stored videos and images in the 'Memory' folder and saved special measurement data in the 'SpecialMeasurements' folder. Go to the specific special measurement workflow and measurement of which you would like to download a report. For the sake of the example we go to the 'SpeechLevelReductionMeasurements' folder, open the 'Test_SLR' measurement folder and select the box next to the 'SLR-result' measurement which can be found within the 'Test_SLR' measurement folder. Thereafter, click on the 'Download' button on the bottom of your screen.



A report will be download in the .pdf format presenting the result of the measurement as performed on the CAM iV64. Below an example is shown of a report that can be downloaded after performing a Speech Level Reduction measurement.

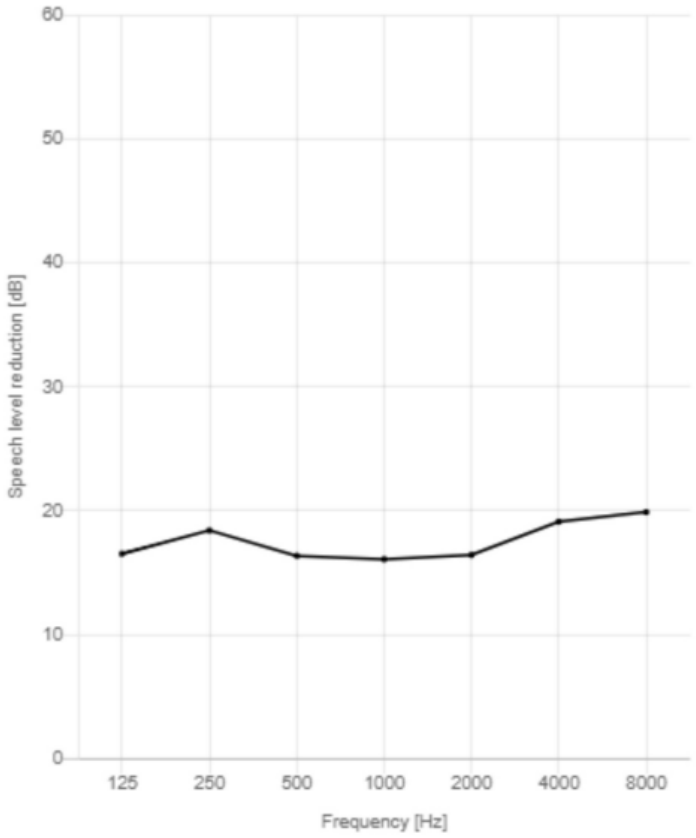
Speech Level Reduction Report

NEN-ISO 23351-1

Operating condition:
Normal
Product:
Meeting cube
Name of operator:
Engineer 1

Manufacturer/Client info
Cube factory
Test Laboratory/measurement location
Sorama

Frequency [Hz]	Speech level reduction [dB]
125	16.53
250	18.41
500	16.37
1000	16.09
2000	16.43
4000	19.12
8000	19.89
$D_{S,A}$[dB]	16.43



Class	A+	A	B	C	D	Unclassified
$D_{S,A}$[dB]	>33	>30	>25	>20	>15	≤15

5.3.3 Portal Analysis Modules

The analysis modules include Time-, Spectrum-, Spectrogram-, Far-field-, Directional- and Time selection analysis features.

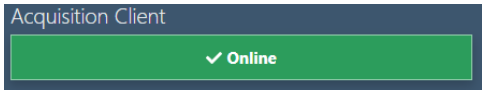
5.3.4 Exporting measurement results from Portal

Once analysis is done in the portal, the measurement results can be exported as .CSV, .PNG, .JPEG, .MP4, .WebM video. Any analysis result that is bookmarked can also easily be exported into a full .pdf report.

5.4 Feature Licensing

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

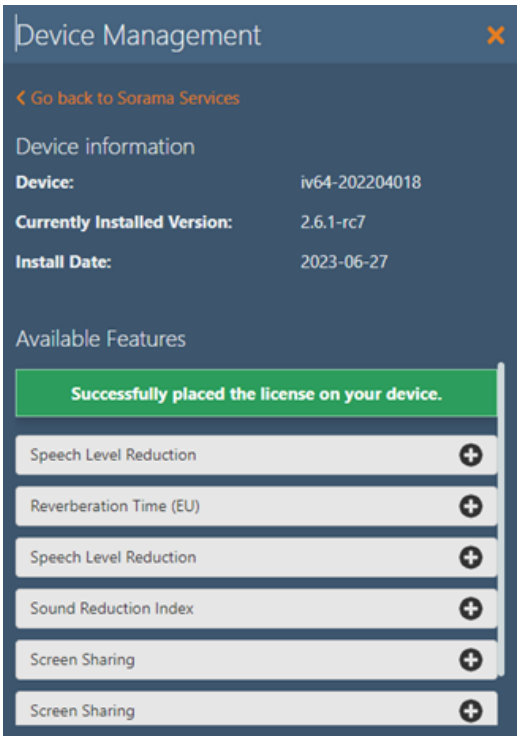
1. Connect your device via the USB-C cable, or internet through Settings > Wi-fi .
2. Login to the Sorama Portal (with the same internet network when using Wi-Fi). In the 'Sorama Services' tab, check if you have installed the latest version of the acquisition client.



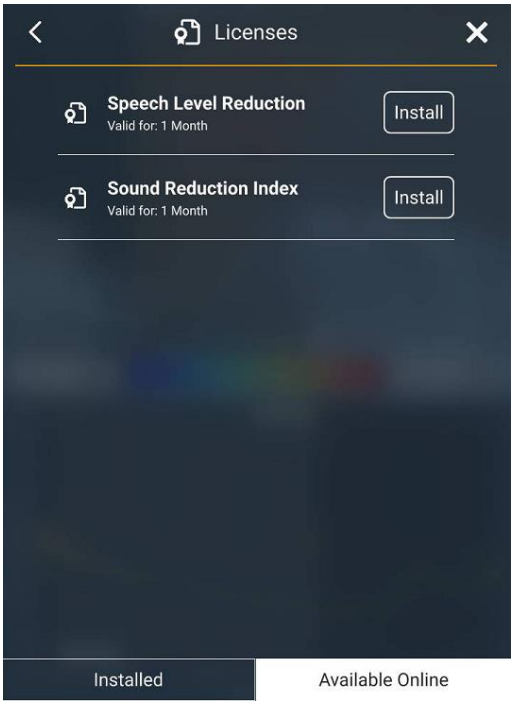
3. Click on your device name in 'Connected Hardware'

at the bottom of the 'services' tab. Click on the device name to enter the 'Device Management' page.

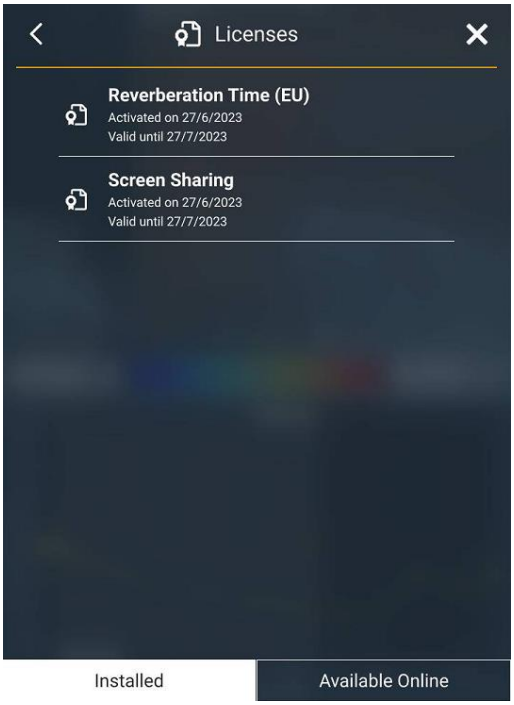
4. Once entered the page, all available features can be found in the 'Device Management' page, tap on '+' to activate and install the selected features to your device.



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



5. Once the feature licenses are successfully transferred to the device, they can be found at 'Setting' Settings > 'Licenses' > 'Installed' Installed.



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.

6 Data Transfer

6.1 How to save the data and what is the format type?

The Product streams audio and video data continuously by default. A short press of the trigger button at the top of the Handgrip will start and save a measurement in a .sor format with a length of up to 30 seconds. Changing the recording format to 'Video', will only store video data in a .webm format. Also, changing the recording type to 'Image', will save an image in a .png image format.

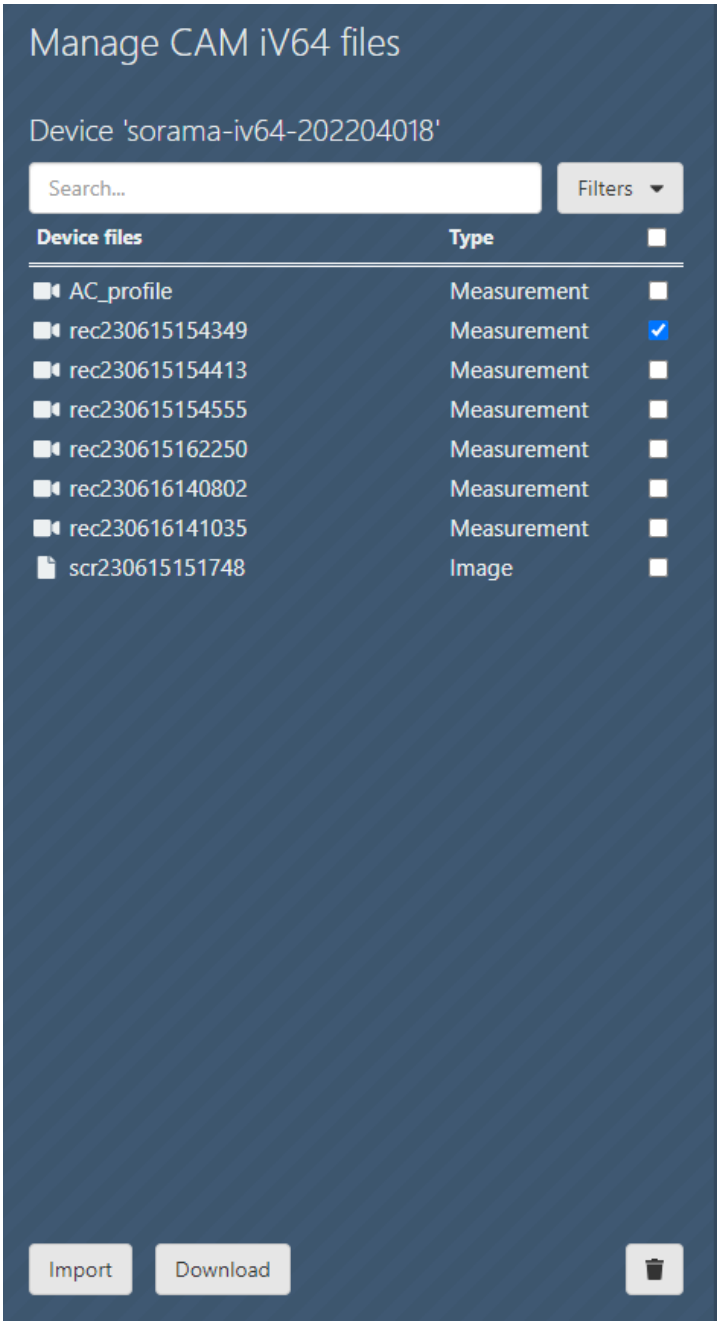
6.2 How to export measurement data?

Measurement data is stored in the Product's internal memory in a .sor, .webm or .png file. It can also be stored on an external memory drive connected via a USB-C port.

You can either export data from the external drive to a computer or connect the supplied USB-C cable from the device to your PC to download the data via Sorama Portal. To export the files in the Sorama Portal, click on 'Manage'

tap once the device is connected, the files selected can be exported by clicking the 'Download'

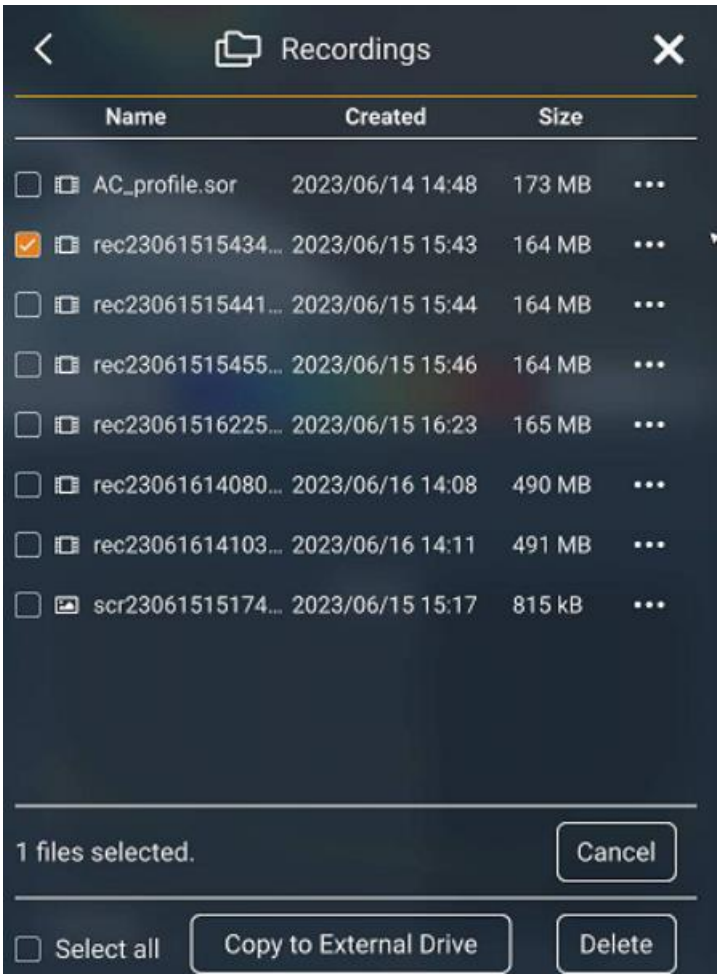
button. The file formats that can be exported from the Sorama CAM iV64 using the Sorama Portal are .sor, .webm and .png. Clicking on the 'Download' will download the selected files directly onto your computer.



If you want to import measurement data to the Sorama Portal for further analysis or to export those further analyzed measurements to your computer, please refer to paragraph §5.3.1.

6.3 How to transfer data from local device to external USB drive?

In the selected folder in ‘Memory‘, press and hold the file for 2 seconds, the multi-selection will appear.



Click on ‘Copy to External Drive’ and click on ‘Copy’ to export the file selected to the external drive.

Once the export is done, the file will be copied in a newly created folder called ‘SoramaExport’ in the external drive.

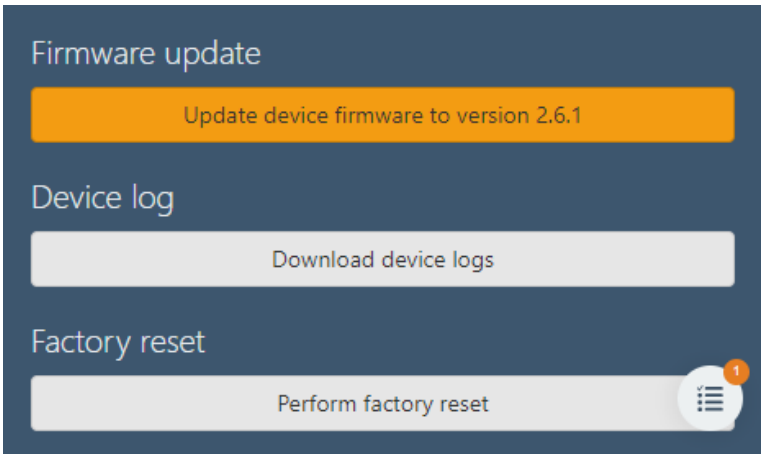
7 Firmware Update / Factory Reset

To keep the Product up-to-date and perform at its best, be sure to update your firmware when new versions are available.

There are 2 options for firmware update, you can either update the device through the USB-C cable via Sorama Portal, or do an on-device update without the need of Sorama Portal when the device is connected to the internet, through Wi-Fi / USB-C cable.

When you have your CAM iV64 connected through USB-C cable, firmware updates and Factory resets are available through the Sorama Portal in the ‘Sorama Services’ tab, click on your device name in 'Connected Hardware'

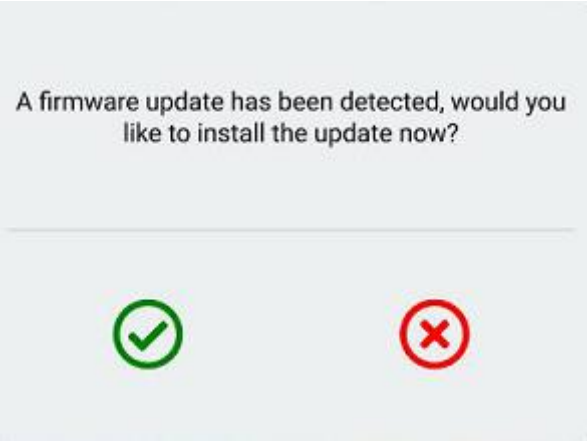
at the bottom of the 'services' tab. Click on 'Firmware Update', 'Download device logs' or ‘Perform factory reset’ for firmware updates, device log download and factory reset the device.



Select confirm. then update/ reset is installed (may take up to 5 minutes) and the Product restarts.

Alternatively, when you are not on Sorama Portal and the device is connected to the internet, the device can be updated without the Sorama Portal. Go to Settings > System Info , click on ‘Check for Updates’ and on-device login to your Sorama Portal account to download the firmware.

Once the download is finished a small window will pop up asking for the firmware installation, click ‘Yes’ and the on-device firmware update is complete.



The firmware update does not interfere with the existing data, needless to worry if the data will be gone after the update is complete.

8 Maintenance

8.1 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.

8.2 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.

8.3 Acoustic sensor care

⚠ Caution

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

8.4 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.

8.5 Service

Contact Sorama for information.

8.6 Specifications

Complete specifications are at www.sorama.eu. See the CAM iV64 Product specifications.