SOUNDCAM ULTRA 3

Product data

Highlights

- 176 microphones at 200 kHz
- Live, on-screen results at 100 fps
- Very high sensitivity with 176 microphones
- Thermal imaging camera integrated
- Handheld and IP54 waterproof
- Integrated LEDs for illumination
- GPS incl. orientation*
- Re-definable frequency range*

Applications

- Compressed air/gas/vacuum leak detection
- Partial discharge detection
- Condition-based monitoring
- Wildlife studies
- Non-destructive testing

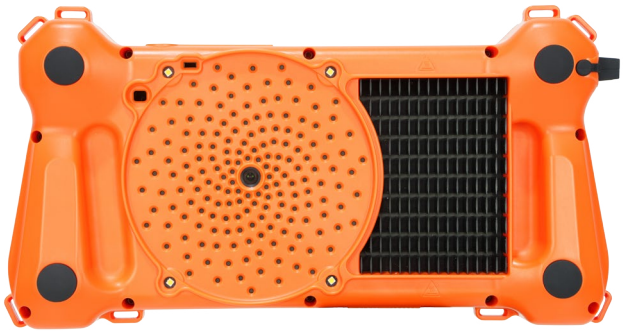
SOUNDCAM ULTRA 3

The Most Versatile and Powerful Ultrasound Camera

www.cae-systems.de

Why SoundCam Ultra 3?

- Wide frequency range for more sensitive detection and better noise suppression
- Ready for all applications with 4 modes: Pro, Easy, Leakage and Partial Discharge
- Don't miss anything by re-defining the frequency range later on*
- Pinpoint listen-in including making ultrasound audible
- High frame rate of the acoustic video for the detection of transient sounds and for distinguishing between transient and permanent sounds
- Global shutter and high frame rate of the optical video for fast-moving objects or fast movements
- High frame rate synchronised acoustic and camera video shows sound origin and propagation



Hardware

Physical Properties	Dimensions	31 x 16 x 5,5 cm (12,2 x 6,3 x 2,2 inch)
	Weight	1,5 kg (3,3 lb)
	Waterproof	IP54
	Operation	Two-, one-handed, shoulder strap, tripod
	Battery life	10 h (3,5 h (built-in) + 6,5 h (external))
	Bat. charging time	1,5 h (built-in) und 4 h (external)
	Tripod socket	1/4 inch
	Buttons	8 configurable + on/off switch
	Operating temp	-20°C to 50°C (-4°F to 122°F)
	Charging temp	0°C to 45°C (32°F to 113°F)
	Storage temp	-30°C to 60°C (-22°F to 140°F)
Display	Size	7 inch / 15 x 9,4 cm
	Resolution	1280 x 800 px
	Brightness	Adjustable
	Readability	Excellent through optical bonding
	Touch	Capacitive 10-finger touch
Embedded Controller	Internal memory	1TB M.2 SSD
	OS	Linux
Interfaces	USB A 3.0	Data export
	Ethernet	LAN (for running the PC software)*
	Audio	3.5 mm port for headphones
	USB C	Charging and data export*
Microphones	Microphones	176 digital MEMS
	Frequency range	Up to 100 kHz
	Sample rate	200 kHz
	Sound pressure	Max. 120 dB
	Resolution	24 bit
	Beamforming	100 fps
Optical Camera	Type	Digital
	Resolution	640 x 480 px at 56 fps
	Illumination	4 LEDs
	Aperture angle	70° x 55° (FoV horizontal x vertical)
	Shutter	Global shutter
	Night vision	Yes (external IR illumination recommended)
Additional Sensors	ToF (Time of Flight)	Distance measurement for <1.5 m*
	GPS	Position incl. orientation*
Power	Built-in battery	Li-ion battery (48 Wh)
	External battery	Li-ion-battery (88 Wh) 16 x 8,5 x 2,5 cm (6,2 x 3,3 x 1 inch)
	Input	20 V via USB C
	Management	Smart: work and charge at the same time

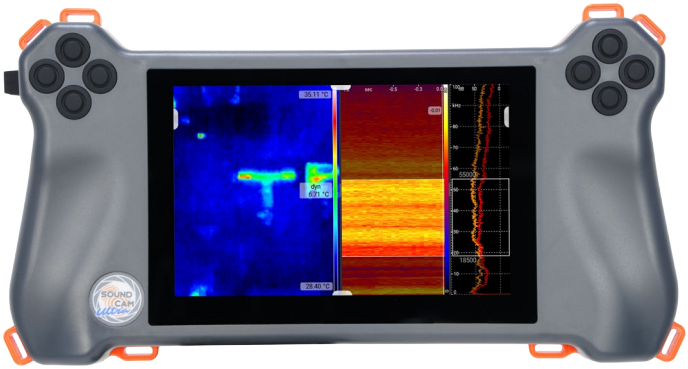
Software

OS	Linux (for the device), Windows (for laptop/PC)
HMI	Touchscreen, headphones, configurable buttons
Protection	Password (protection against unauthorized access)
Functions	Local and global spectrum (narrowband, 1/3rd octave and octave), spectrogram, acoustic, optical and thermal image
	Setting the distance
	Frequency filter (narrowband, 1/3rd octave and octave)
	3 scaling modes: Smart, Auto, Manual
	Pinpoint listen-in (broadband or frequency-filtered) incl. making ultrasound audible
	Take photo with comment
	Playback in real time, slow motion or frame by frame
	Low cut level
	Mark points in time
	Adjust window sizes
	Project-based work via measurement series
	Create and manage measurement presets
	Time weighting: fast, slow, impulse*
	File manager for copying, moving, deleting, exporting and viewing files
Modes	Pro: Expert mode with extended range of functions
	Easy: Simplified modes for a quick start
	Leak: Optimized mode for the detection of leaks including real-time display of the loss rate
	Partial discharge: Optimized mode for the detection of partial discharges including real-time display of the PRPD diagram
	Network: Remote control of the device via the Windows software*
Recording	Ring buffer: 10 s, 30 s, 60 s or 180 s (Windows only)
	Trigger recording: SPL- or frequency-triggered up to 10 s with pre-run plus post-run time
	Long-term measurement: One image (average and peak hold) every 10 to 900 seconds (adjustable)
Export	Photo, video, audio, measurement data
Units	Metric or imperial system
Languages	German, English, Spanish, Croatian, Italian, Japanese, Korean, Polish, Turkish, Chinese

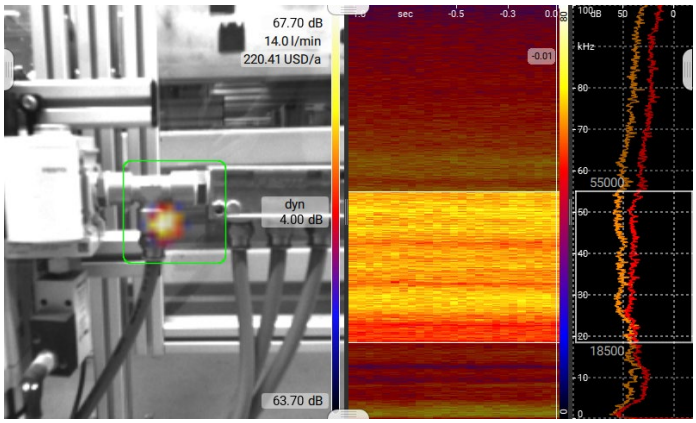
Integrated Thermal Imaging Camera

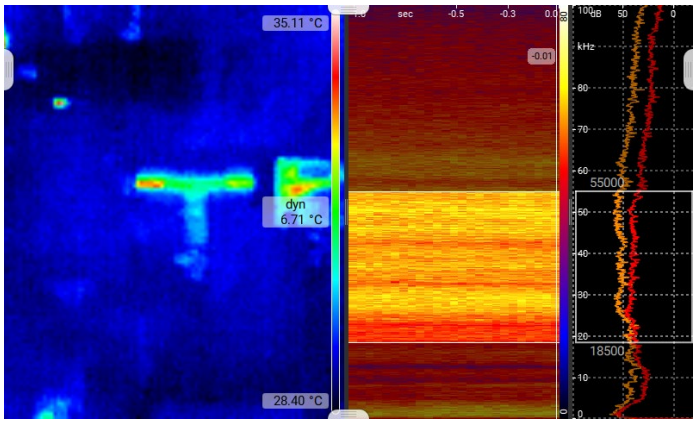
- 2-in-1 device: Acoustic and thermal imaging camera in one device
- Simultaneous detection and recording of acoustic and thermal images
- Checking the correlation between acoustics and heat creates a deeper understanding of the result
- Improved detection of faults and anomalies through the combination of acoustic and thermal images
- Parallel evaluation of acoustic and thermal images enables more precise and comprehensive diagnosis and analysis

Thermal Imaging Camera	
Sensor Technology	Uncooled microbolometer
Thermal Spectral Range	Longwave infrared, 8 µm to 14 µm
Array Format	160 x 120 progressive scan
Pixel Size	12 µm
Frame Rate	8.7 fps
Thermal Sensitivity	<50 mK (0.050°C)
Temperature Compensation	Automatic. Output image independent of camera temperature.
Radiometric Accuracy	High gain Mode: Greater of +/-5°C or 5% (typical) Low Gain Mode: Greater of +/-10°C or 10% (typical)
Non-uniformity Corrections	Integral Shutter
Scene Dynamic Range	High Gain Mode: -10° to +140°C Low Gain Mode: -10° to +400°C
Image Optimisation	Factory configured and fully automated
FOV - Horizontal	57° (nominal)
FOV - Diagonal	71°
F-Number	f/1.1
Temperature unit	Kelvin, Celsius, Fahrenheit
Color palette	Color (rainbow), Fusion
Scaling modes	Auto, Manuell



The integrated thermal imaging camera is located next to the microphone array.

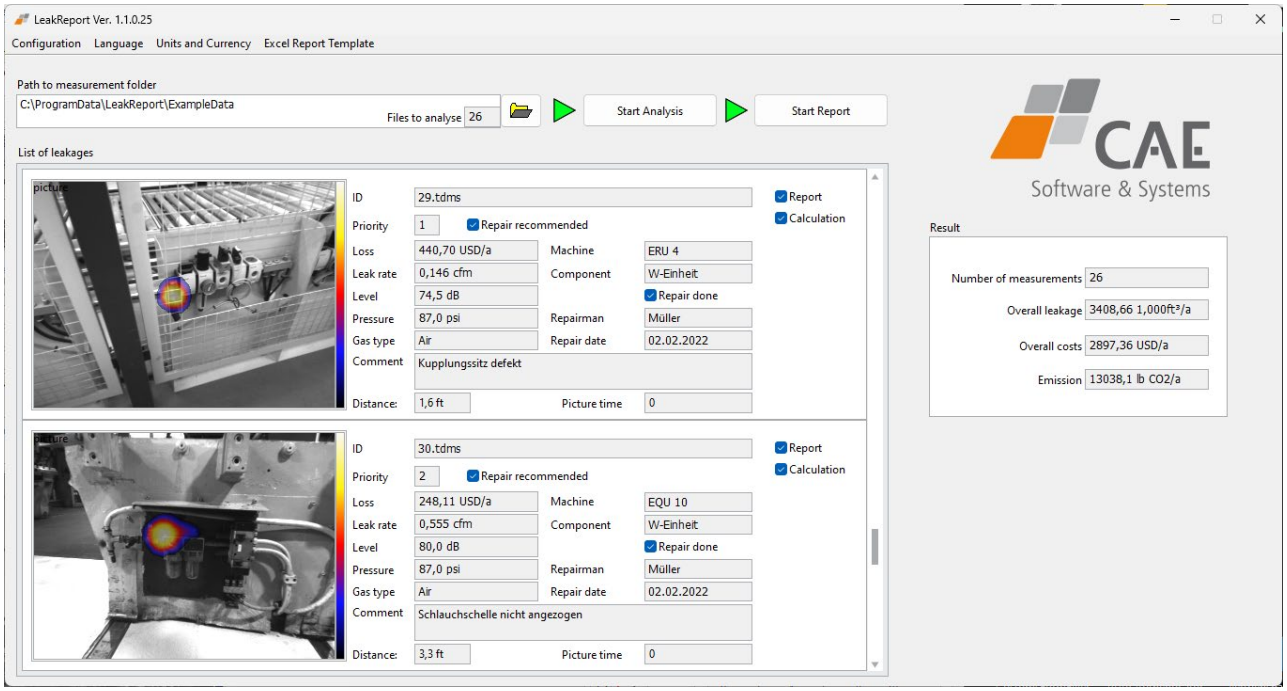




Measurement of a compressed air leak. The acoustic image can be seen on the left and the thermal image on the right.

Application: Localizing Leaks

- Large-area scanning saves a lot of time compared to other leak detection systems
- Detection from a great distance even during loud, ongoing production
- Get started immediately through leakage mode
- Real-time display of the loss rate
- Automatic distance measurement at close range for a more accurate estimate of leaks*
- The Windows software LeakReport evaluates the leaks, prioritizes them by size and summarizes them into a report
- Front LED floodlights for illuminating dim areas



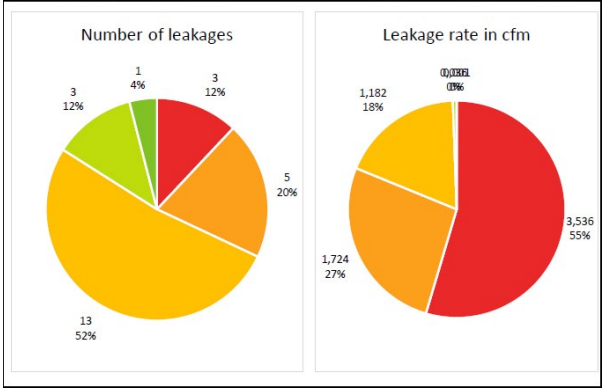
The Windows software LeakReport displays all leaks found, categorizes them by size and summarizes them into a report.

Author	Max Mustermann	Date	25.01.2024	Time	16:34
Device	SoundCam Ultra				
Software	V1.2.444				

Summary

Number of measurement	26				
Comment					
Costs per volume	0.85 USD/1,000 ft³			Energy Costs	0.20 USD/kWh
Running time per year	8760 h			CO2 Emission	0.900 lb/kWh
Overall leakage per year	3406 1,000 ft³	=	6.48 cfm	Gas type	Air
Overall costs per year	2894.84 USD			Currency	USD
CO2 emissions per year	13027 lb CO2			Volume Unit	cfm

	Priority 1	Priority 2	Priority 3	Priority 4	Priority 5
Number of leakages	3	5	13	3	1
Leakage rate in cfm	3.536	1.724	1.182	0.036	0.001



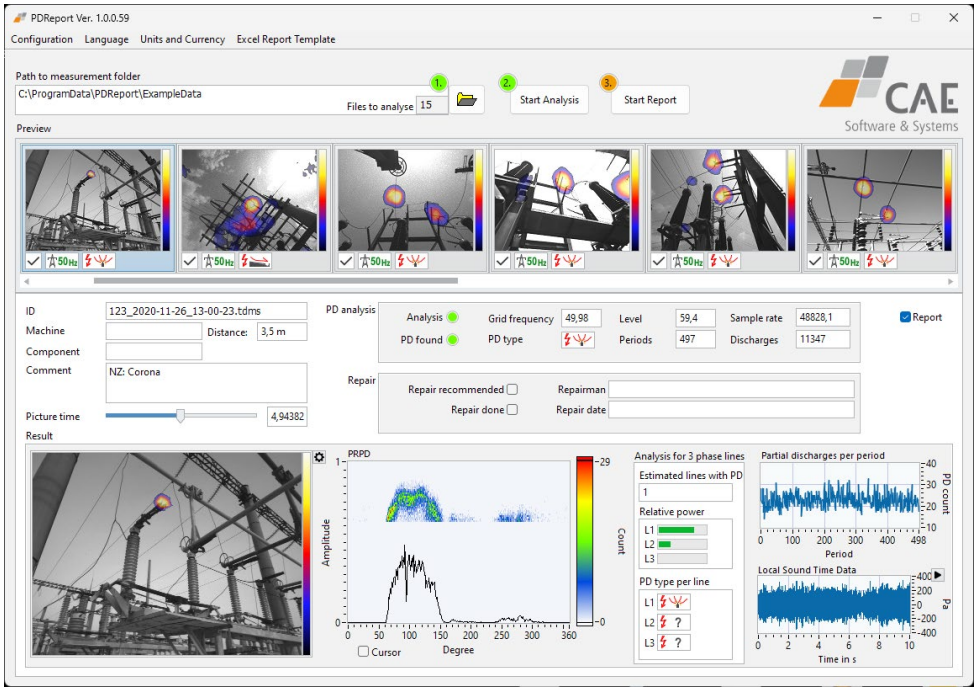
Summary of leakages

ID	Leak rate	Loss/year	Priority	Repaired
10 (TDMS Dateiname).tdms	0,00 cfm	1,83 USD	4	✓
11.tdms	0,03 cfm	13,07 USD	3	✗
12.tdms	0,00 cfm	0,35 USD	5	✓
13.tdms	0,04 cfm	16,76 USD	3	✗
14.tdms	0,45 cfm	200,02 USD	2	✗
15.tdms	0,07 cfm	32,81 USD	3	✓
16.tdms	0,02 cfm	10,69 USD	3	✗
17.tdms	0,23 cfm	104,75 USD	2	✗
18.tdms	0,08 cfm	37,20 USD	3	✗
19.tdms	0,05 cfm	24,04 USD	3	✗
20.tdms	0,08 cfm	37,19 USD	3	✗
21.tdms	0,15 cfm	65,42 USD	3	✗
22.tdms	0,23 cfm	104,70 USD	2	✗
23.tdms	0,21 cfm	92,33 USD	3	✗
24.tdms	1,00 cfm	447,85 USD	1	✗
25.tdms	1,69 cfm	756,48 USD	1	✗
26.tdms	0,05 cfm	22,38 USD	3	✓
27.tdms	0,13 cfm	57,21 USD	3	✓
28.tdms	0,12 cfm	53,91 USD	3	✗
29.tdms	0,15 cfm	65,19 USD	3	✓
30.tdms	0,56 cfm	248,11 USD	2	✓
31.tdms	0,84 cfm	375,44 USD	1	✗
32.tdms	0,25 cfm	112,71 USD	2	✗
33.tdms	0,01 cfm	5,33 USD	4	✗
34.tdms	0,01 cfm	4,97 USD	4	✗
35.tdms	0,02 cfm	9,06 USD	4	✗

Two pie charts in the report provide a quick overview of the number of leaks found and the loss.

Application: Detection of Partial Discharges

- Large-area scanning saves a lot of time compared to other partial discharge measurement systems
- Contactless measurement is very easy to carry out
- Detection from a great distance, even in noisy surroundings
- Get started immediately through partial discharge mode
- Very good readability and high color transmission of the display thanks to optical bonding, even in bright sunlight
- Real-time display of the PRPD diagram
- The Windows software PDReport analyzes the partial discharges, categorizes them by type and summarizes them into a report
- GPS incl. orientation for clear identification of the equipment*

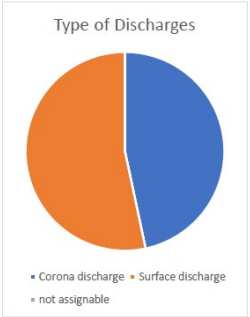


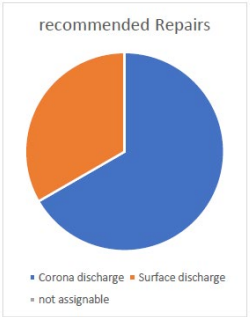
The Windows software PDReport displays all detected partial discharges, categorizes them by type and summarizes them into a report.

Author	Max Mustermann	Date	25.01.2024	Time	17:25
Device	SoundCam Ultra				
Software	V1.2.444				

Summary

Number of measurement	15	
Comment		
Total per type		Total of repairs recommended
Corona discharge	7	2
Surface discharge	8	1
not assignable	0	0



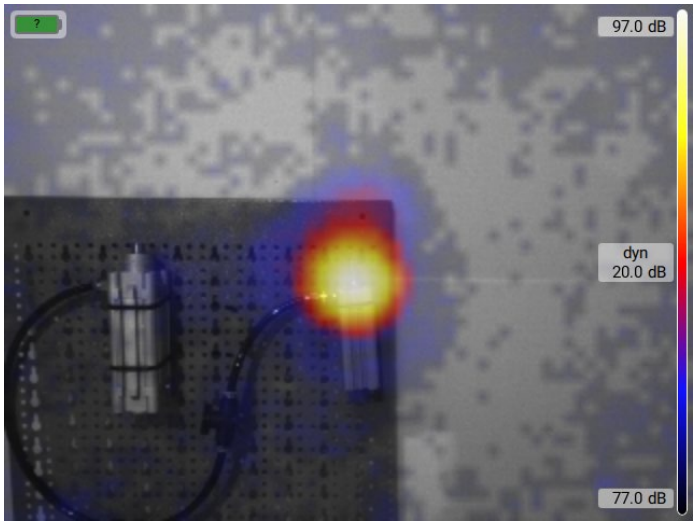


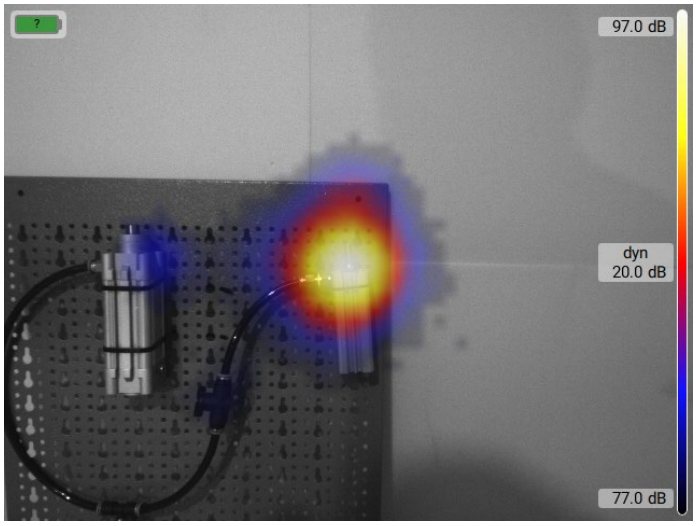
Summary of partial discharges

ID	Distance	PD type	Discharges	Repair recommended
example0.tdms	3,50 m	corona discharge	18.927	Yes
example1.tdms	3,50 m	corona discharge	11.347	Yes
example10.tdms	3,50 m	surface discharge	27.448	Yes
example11.tdms	20,00 m	surface discharge	30.752	No
example12.tdms	1,47 m	surface discharge	28.276	No
example13.tdms	3,50 m	surface discharge	38.978	No
example14.tdms	10,00 m	surface discharge	31.851	No
example2.tdms	3,50 m	surface discharge	33.176	No
example3.tdms	20,00 m	corona discharge	29.334	No
example4.tdms	20,00 m	corona discharge	41.461	No
example5.tdms	20,00 m	corona discharge	26.415	No
example6.tdms	6,49 m	corona discharge	12.026	No
example7.tdms	6,49 m	surface discharge	20.483	No
example8.tdms	6,49 m	corona discharge	22.588	No
example9.tdms	3,50 m	surface discharge	41.516	No

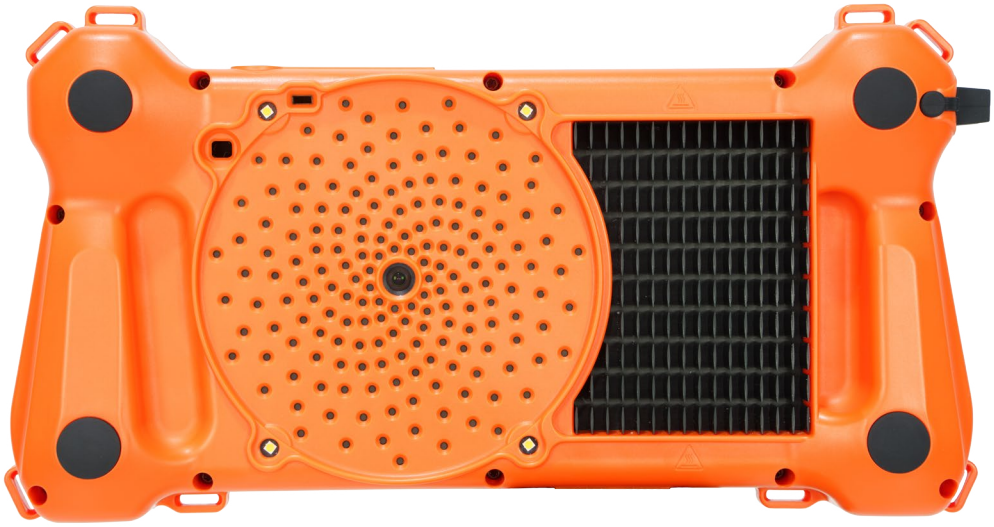
Two pie charts in the report provide a quick overview of the number of partial discharges found and their classification.

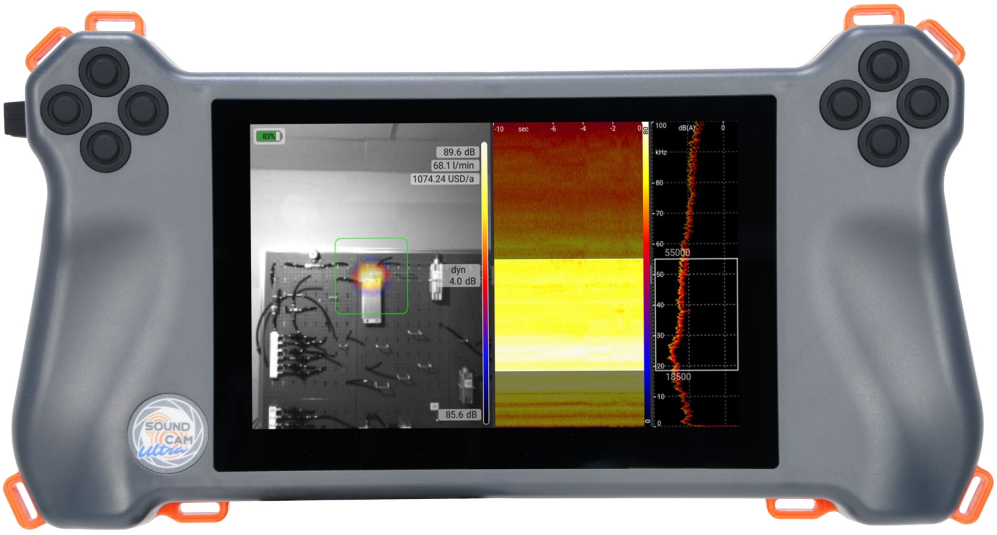
More to See with 176 Microphones!





The device's 176 microphones increase the sensitivity and dynamic range: the result of a conventional acoustic camera with around 70 microphones can be seen on the left. The large leakage is detected, but the smaller leakage is not. It disappears in the acoustic fog due to the limited dynamic range. More microphones improve the sensitivity and dynamic range. On the right is the result of the Ultra 3. The large and small leaks are visible. Even at 20 dB dynamic range, no acoustic fog is visible.





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* The function will be made available with an update.