

Product data

SOUNDCAM ULTRA 3

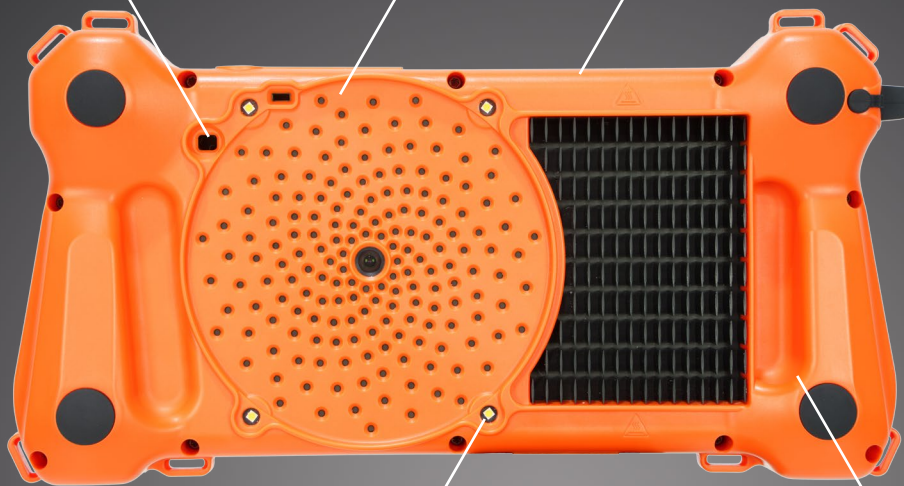
Ultrasonic camera: powerful, intuitive, versatile



Built-in thermal imaging camera

High sensitivity from 176 microphones with 200 kHz sampling rate

Additional sensors:
ToF camera, GPS, compass and position sensor



Built-in LEDs for illumination

Ergonomic design and
IP54 waterproof







Configurable hardware buttons



Live, on-screen results at 100 acoustic fps

Easy to use thanks to intuitive software

Typical applications

- | | | | |
|--|--|---|----------------------------|
|  | Compressed air/gas/vacuum leak detection |  | Wildlife studies |
|  | Detection of partial discharge |  | Non-destructive testing |
|  | Condition monitoring |  | Mechanical fault detection |

Hardware High-performance

The new **SoundCam Ultra 3** is an ultrasound-capable camera with outstanding performance features. The high number of microphones ensures high-resolution images with very high dynamics. Even weak sound sources can be made visible in the presence of strong sources. Of course, the microphone data is analyzed in real time. Simultaneous data from the optical and thermal imaging camera as well as other sensors ensure optimum information acquisition with very simple and intuitive operation. In addition to the standard mode, which is very easy to operate, and the Pro mode, which is used for very sophisticated analyses, operating modes are implemented for special applications, such as the leakage mode for locating and quantifying leaks in compressed air systems or the partial discharge mode for locating and evaluating partial discharges on high-voltage systems. The SoundCam Ultra 3 is not only a superior measuring instrument, but with the help of a Windows software package it is also a comprehensive tool that takes you all the way to the finished PDF report of your leaks or partial discharges.

The SoundCam Ultra 3 combines ease of use with performance, completes measurement tasks right up to the report and is resource-saving.

- » Extremely high dynamic range and accuracy thanks to the optimized array with 176 microphones and 200 kHz sampling rate at 24 bit resolution
- » Wide frequency range for more sensitive detection and better noise suppression
- » High frame rate of the acoustic video for the detection of transient noise
- » Synchronization between acoustic and optical video for high analysis accuracy
- » Global shutter and high frame rate of the optical video for fast-moving objects or fast movements
- » Simultaneous acquisition and recording of the acoustic, optical and thermal image
- » Very good readability and high color transmission of the display thanks to optical bonding, even in bright sunlight



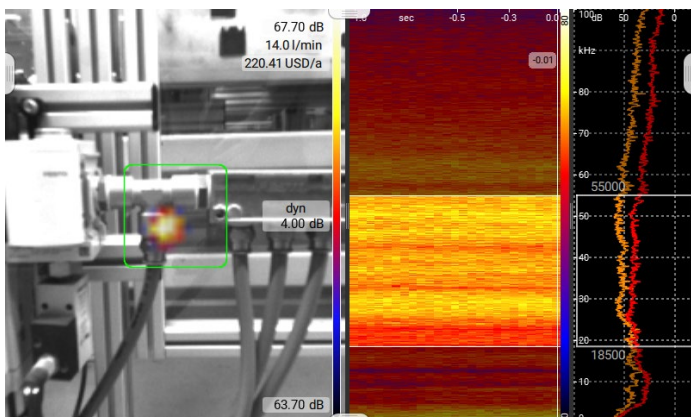
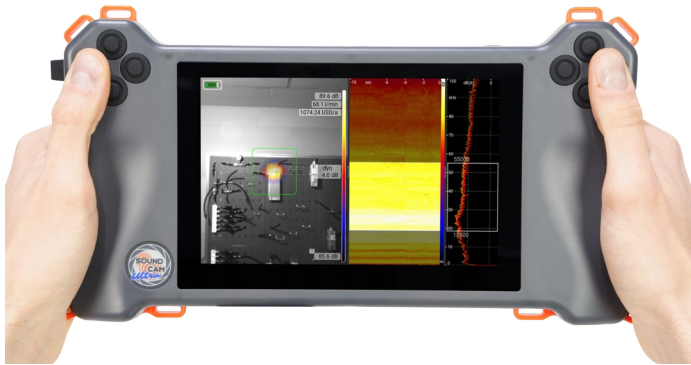
Hardware

| | | | |
|-------------------------------|----------------------------------|---|--|
| Microphones | Number | 176 digital MEMS microphones | |
| | Frequency range | Up to 100 kHz | |
| | Sample rate | 200 kHz | |
| | Sound pressure | Max. 120 dB | |
| | Resolution | 24 bit | |
| | Beamforming | 100 fps | |
| Optical Camera | 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) | |
| Thermal Imaging Camera | Sensor Technology | Uncooled microbolometer | |
| | Spectral Range | Longwave infrared, 8 µm to 14 µm | |
| | Resolution | 160 x 120 progressive scan | |
| | Frame Rate | 8,7 fps | |
| | Sensitivity | <50 mK (0,050°C) | |
| | T.-Compensation | Automatic | |
| | Measuring Range and Accuracy | -10° to +140°C with +/-5°C or 5% -10° to +400°C with +/-10°C or 10% Larger value is to be applied | |
| | Aperture angle | 57° x 44° (FoV horizontal x vertical) | |
| Display | Temperature unit | Kelvin, Celsius, Fahrenheit | |
| | Size | 7 inch | |
| | Resolution | 1280 x 800 px | |
| | Brightness | Adjustable | |
| | Readability | Excellent through optical bonding | |
| | Touch | Capacitive 10-finger touch | |
| Additional Sensors | ToF (Time of Flight) | Distance measurement for <1,5 m* | |
| | GPS, compass and position sensor | Position, orientation and inclination* | |
| 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* | |
| 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) | |
| | Protection class | IP54 waterproof | |
| | 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) | |
| | Power | Built-in battery | Li-ion battery (48 Wh) |
| | | External battery | Li-ion-battery (88 Wh) 16 x 8,5 x 2,5 cm |
| Input | | 20 V via USB C | |
| Management | | Smart: use and charge at the same time | |

Software Comprehensive and intuitive

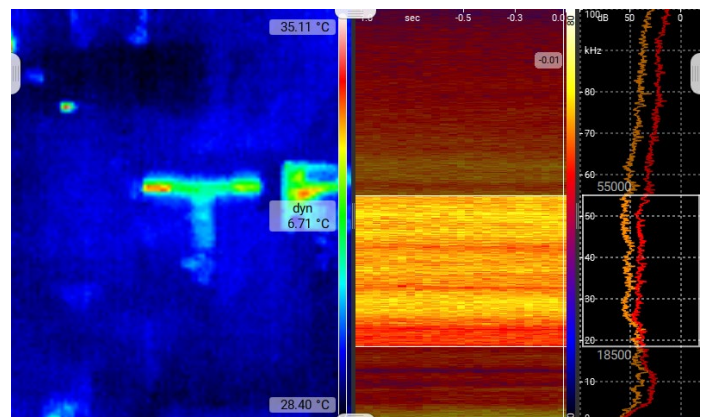
The software of the new **SoundCam Ultra 3** is intuitive and very easy to use. The structured user interface starts directly with the most important menus and very useful measurement modes for fast and efficient work. At the touch of a button, the Ultra 3 starts the measurement and finds the acoustic source very quickly. The measurement modes have preset parameters so that any user can carry out the measurements without prior knowledge. Important information such as the leakage loss or the PRPD diagram are displayed in the corresponding mode. The file manager is the perfect interface between Ultra 3 and the PC. The measurement data can be analyzed and evaluated using identical software on the PC. An evaluation and documentation software for the leakages and partial discharges creates a meaningful report in the shortest possible time. The software package for the Ultra 3 is extremely high-performance, user-friendly and inclusive. There are no extra costs or running costs.

- » Four modes with preset parameters: Standard, Pro, Leakage and Partial discharge
- » Live, on-screen results at 100 acoustic fps
- » Three acoustic scaling modes
 - » Smart: Suppression of background noise
 - » Auto: Dynamic scaling
 - » Manual: Comparison with a reference level
- » Creation of measurement profiles to be able to carry out recurring measurements with the same settings
- » Pinpoint listen-in including making ultrasound audible
- » Trigger function for automated recording when a level or frequency curve is exceeded
- » Create measurement series
- » Create photos and videos



Measurement of a compressed air leak: The leak can be clearly identified in the acoustic image.

| Software | |
|-------------------|--|
| Modes | Standard: Simplified mode for a quick start Pro: Expert mode with extended range of functions Leak: Optimized mode for the detection of leaks including real-time display of the loss rate Partial Discharge: Optimized mode for PD detection including real-time display of the PRPD diagram Network: Remote control of the device via the Windows software* |
| Functions | Local and global spectrum (narrowband, 1/3rd octaves and octaves), spectrogram , acoustic, optical and thermal image Setting the distance Frequency filter (narrow band, 1/3rd octaves and octaves) 3 acoustic scaling modes: Smart, Auto, Manual Pinpoint listen-in (broadband or frequency-filtered) incl. making ultrasound audible Screenshot with comment option Playback in real time, slow motion or frame by frame Marking of events Adjustment of window sizes Project-based work via measurement series Creation and management of measurement profiles Time weighting: fast, slow, impulse* File manager for copying, moving, deleting, exporting and viewing files |
| 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 s to 900 s (adjustable) |
| Export | Photo, video, audio, measurement data |
| Units | Metric or imperial system |
| Languages | German, English, Spanish, Croatian, Italian, Japanese, Korean, Polish, Turkish, Chinese |
| OS | Linux (for the device), Windows (for laptop/PC) |
| Protection | Password protection against unauthorized access |



The thermal image shows cooling at the leakage point compared to the surrounding component temperature.

Application Pinpointing compressed air leaks

The simple transfer of the measurement data from the device to the PC via a USB stick allows the measurements to be analyzed and evaluated quickly. The evaluation and documentation software for compressed air leaks generates a meaningful report in the shortest possible time. All relevant data are presented clearly and efficiently with images, diagrams and tables.

- » Detection of leaks from a great distance, even during ongoing, noisy production
- » Large-area scanning saves a lot of time compared to other leak detection methods
- » Live, on-screen display of losses for immediate assessment
- » Easy to operate without prior knowledge thanks to the leakage mode
- » Automatic distance measurement at close range for a more accurate assessment of leaks*
- » The Windows software LeakReport displays all detected leaks, classifies them by size and summarizes them in a report



Choose measurement data

Analyze measurements

Create report

List of all leaks

Location of the leak

Leak details

Result for all leaks

| ID | Priority | Date | Machine | Component |
|----------|----------|------------|-------------|-----------|
| A24.tdms | 4 | 2023-12-01 | Werkstatt 2 | |
| A29.tdms | 3 | 2023-12-01 | ERU 4 | W-Einheit |

Result

Number of measurements: 34

Overall leakage: 12351.3 m³/a

Overall costs: 3705,39 EUR/a

Emission: 7559 kg CO2/a

Get a detailed report quickly and easily in three steps: select measurement files, start analysis, generate report

Cover page

Classification of leaks by number and severity

Savings and savings potential

Detailed view of the leaks

| Measurement | 2021-11-19 | 2024-04-18 |
|-----------------------------|---------------|--------------|
| Number of Measurements | 34 | 25 |
| Leakage rate | 234.994 L/min | 21.474 L/min |
| Leakage rate to be repaired | 209.231 L/min | 4.289 L/min |
| Leakage rate non-repairable | 4.289 L/min | 4.289 L/min |

| Category | Current | Potential | Non-repairable |
|------------------------|------------|-------------|----------------|
| Leakage | 3705 EUR/a | ± 741 EUR/a | 7559 kg CO2/a |
| Leakage to be repaired | 339 EUR/a | ± 68 EUR/a | 69 kg CO2/a |
| Leakage non-repairable | 3299 EUR/a | ± 660 EUR/a | 6730 kg CO2/a |

The pie charts in the report provide a quick overview of the number of leaks found, the loss and possible savings.

Application Detection of partial discharges

The simple transfer of the measurement data from the device to the PC via a USB stick allows the measurements to be analyzed and evaluated quickly. The evaluation and documentation software for partial discharges generates a meaningful report in the shortest possible time. All relevant data are presented clearly and efficiently with images, diagrams and tables.

- » Detection from a great distance, even in noisy surroundings
- » Large-area scanning saves a lot of time compared to other partial discharge measurement methods
- » Low effort thanks to contactless measurement
- » Live, on-screen display of the PRPD diagram for immediate assessment
- » Easy to operate without prior knowledge thanks to PD mode
- » The Windows software PDReport displays all detected partial discharges, categorizes them by type and summarizes them in a report
- » GPS, compass and position sensor for clear identification of the system*



Choose measurement data

Configuration Language Units and Currency Excel Report Template

Path to measurement folder: C:\ProgramData\PDReport\ExampleData

Files to analyse: 15

Start Analysis Start Report

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Preview: [Grid of 5 small PRPD diagrams]

ID: 123_2020-11-26_13-00-23.tdms

Machine: Distance: 3.5 m

Component: NZ: Corona

Comment:

Picture time: 4,94382

PD analysis: Analysis [On] Grid frequency: 49,98 Level: 59,4 Sample rate: 48828,1

PD Found [On] PD type: [Icon] Periods: 497 Discharges: 11347

Repair: Repair recommended [Off] Repairman: Repair date:

Result: [PRPD Diagram] [Local Sound Time Data]

Analyze measurements

Create report

Overview of the partial discharge

List of all partial discharges

Localization of the partial discharge

PRPD diagram and classification of the partial discharge

Get a detailed report quickly and easily in three steps: select measurement files, start analysis, generate report

Report | 27.05.2024

PDREPORT

Report: 2024.05.27 - 16054mi21aac
Company: CAE Software und Systems GmbH
Address: Linderlöh Strasse 23, 33334 Guterloh

Author: Max Mustermann Date: 27.05.2024 Time: 16:05

Device: SoundCam Ultra Software: V2.2.4047

| Summary | Value |
|-----------------------|------------------------------|
| 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 | Distance | PD type | Discharges | Repair recommended |
|-------------------------------|----------|-------------------|------------|--------------------|
| np1601.tdms | 3,50 m | corona discharge | 18,927 | Yes |
| np161.tdms | 3,50 m | corona discharge | 11,847 | Yes |
| np162.tdms | 20,00 m | surface discharge | 27,448 | Yes |
| np163.tdms | 1,847 m | surface discharge | 28,276 | No |
| np164.tdms | 3,50 m | surface discharge | 38,976 | No |
| np165.tdms | 20,00 m | surface discharge | 31,811 | No |
| np166.tdms | 3,50 m | surface discharge | 31,176 | No |
| np167.tdms | 20,00 m | corona discharge | 20,134 | No |
| np168.tdms | 20,00 m | corona discharge | 41,462 | No |
| np169.tdms | 20,00 m | corona discharge | 26,411 | No |
| np170.tdms | 6,49 m | corona discharge | 11,026 | No |
| np171.tdms | 6,49 m | surface discharge | 20,483 | No |
| np172.tdms | 6,49 m | corona discharge | 22,588 | No |
| np173.tdms | 3,50 m | surface discharge | 41,510 | No |

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Cover page

Classification of partial discharges by type

Overview of all partial discharges

Detailed view of the partial discharge

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

Performance Well thought out to the last detail

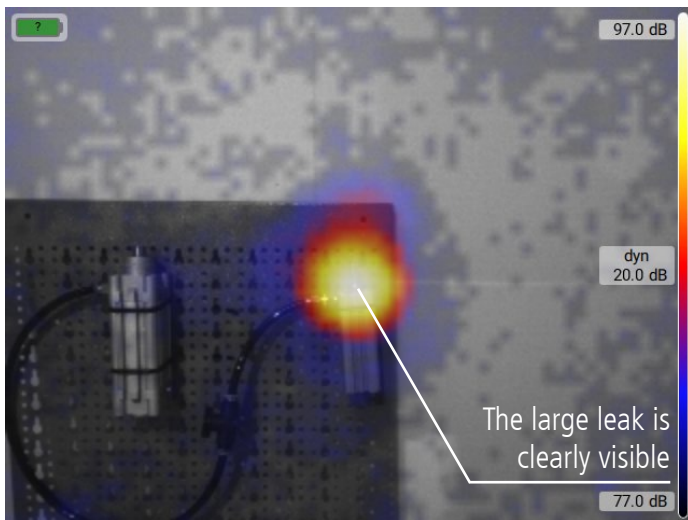


- » Very high sensitivity and dynamic range thanks to 176 microphones with 200 kHz sampling rate at 24 bit resolution
- » Live, on-screen results at 100 acoustic fps
- » Precise synchronization between acoustic and optical video for high analysis accuracy
- » Built-in thermal imaging camera, ToF camera, GPS, compass and position sensor
- » High-resolution display with 1280 x 800 px and very good readability and high color transmission thanks to optical bonding

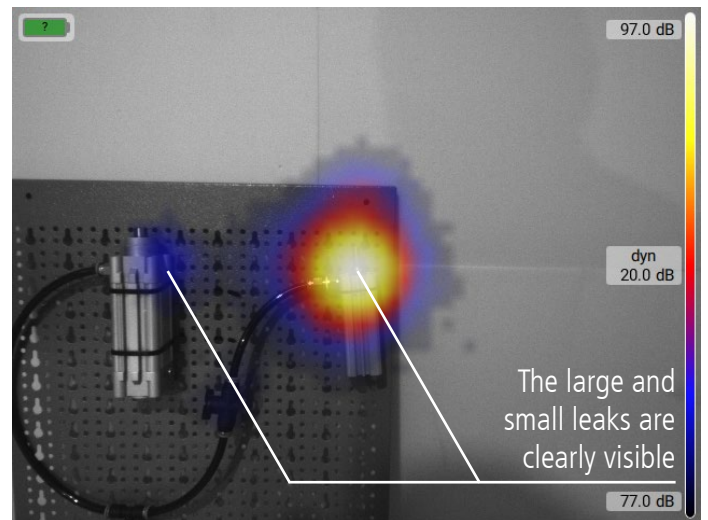


- » Ergonomic hand-held device with protection class IP54 waterproof
- » Can be used without prior knowledge thanks to intuitive software
- » Special operating modes for the localization of compressed air leaks or the detection of partial discharges give results in real time
- » Windows software for fast, detailed evaluation and reporting of compressed air leaks and partial discharges
- » Pinpoint listen-in, including making ultrasound audible, provides additional information

Sensors Extremely sensitive



Result of the SoundCam Ultra, the predecessor model of the SoundCam Ultra 3. This is a very good acoustic camera with 72 microphones. The large leakage is detected very well. The small leakage is not detected as it disappears in the image noise.



The 176 microphones and the optimized microphone array design of the SoundCam Ultra 3 increase the sensitivity and dynamic range immensely. As a result, the large and small leaks are clearly visible. Even at 20 dB dynamic range, no image noise is visible.

More microphones, a higher sampling rate and high 24-bit resolution ensure better, more detailed and more reliable results.