SENSEVEN

Valve Sense

The mobile inspection system for leak detection

WE EMPOWER EVERYONE TO INSPECT INDUSTRIAL ASSETS

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Our Mission

Industrial assets must be inspected regularly to avoid high and unplanned costs. In order to detect defects, companies around the globe spend $ 8 billion on inspection every year.

The problems with today's industrial inspection options are:

> they are complex to use and error prone
> need trained and experienced personnel
> require time-consuming analysis
> use proprietary and closed devices.

This is why at Senseven we are on a mission:

To empower everyone to inspect industrial assets

The industrial inspection of tomorrow

Senseven has developed a new way of equipment testing based on acoustic emission by transforming smartphones into smart and mobile inspection solutions.

Our digital solution is designed in a way that it is:

> easy to use
> requires no expertise or training courses
> is built on a cloud-based infrastructure with open interfaces
> uses common smartphones
> Is equipped with the Senseven App that supports the user during the inspection process and automatically interprets results

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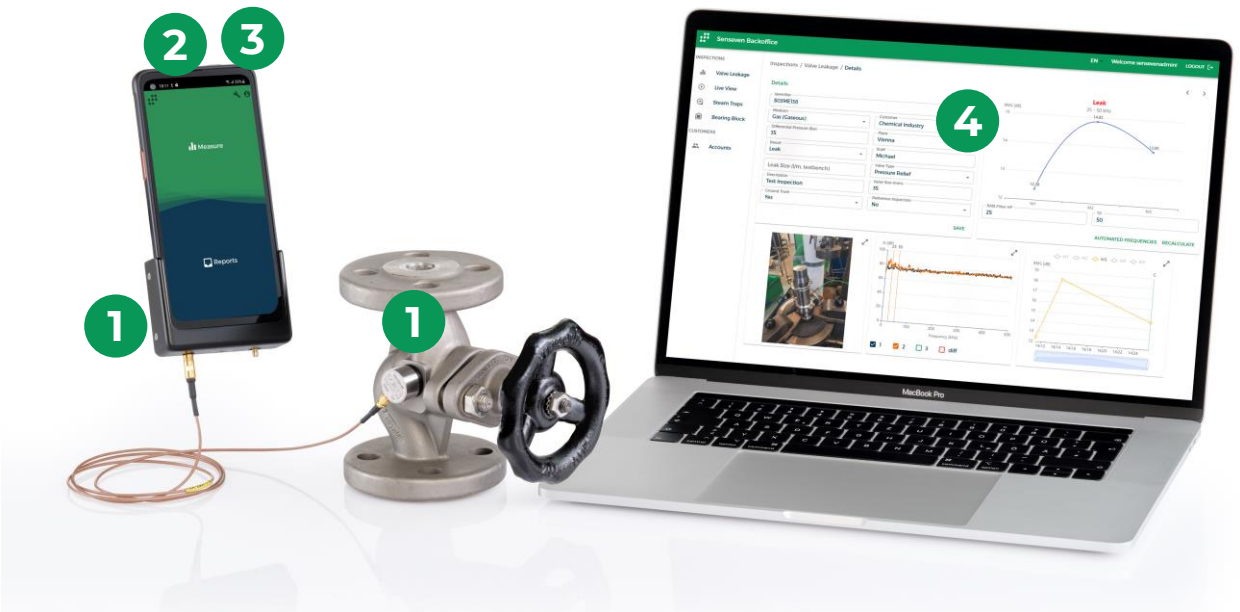
Our offer

The Senseven inspection system is based on the industry-wide established and standardized acoustic emission technology (see DIN EN1330-9), combined with new, digital features. We turn your Smartphone into a smart and mobile inspection system.



1 **Inspection equipment:** State of the art AE sensors and Seven one – our single channel AE measurement device

Senseven Software:

2 **The Senseven App:** Delivered on a conventional smartphone, enables inspection of valves for internal leakage, guides the user through the inspection processes

3 **Seseven Expert Suite:** Enables live view of RMS and dB values as well as live audio

4 **Seseven Backoffice:** get an overview of critical assets, store and analyze data, generate standardized reports and support upcoming maintenance activities

Explore our demo version

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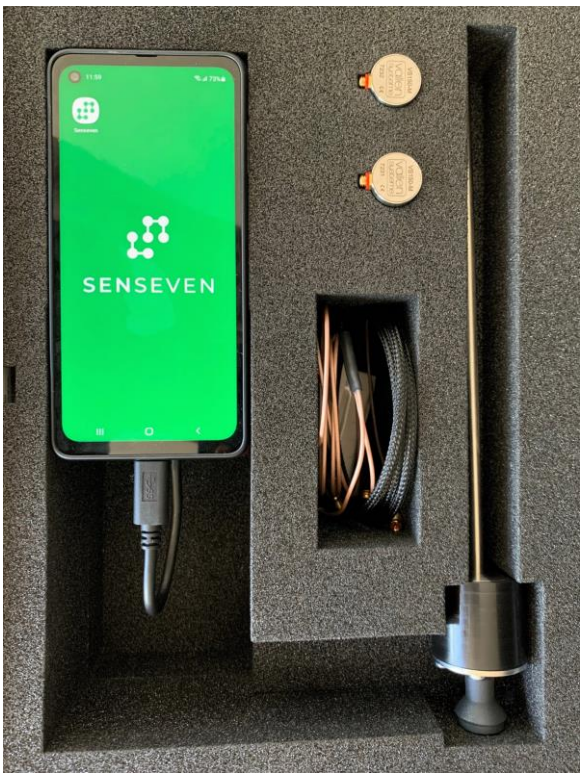
1 The inspection equipment



Our solution is delivered in a hard product shell case consisting of:

- 1 Smartphone Samsung Galay xCover Pro including the Senseven inspection App and charger
- 2 acoustic emission sensors
- 1 Seven one - single channel AE measurement device
- 1 Waveguide for hot and cold surfaces (>100° C and < -50° C)

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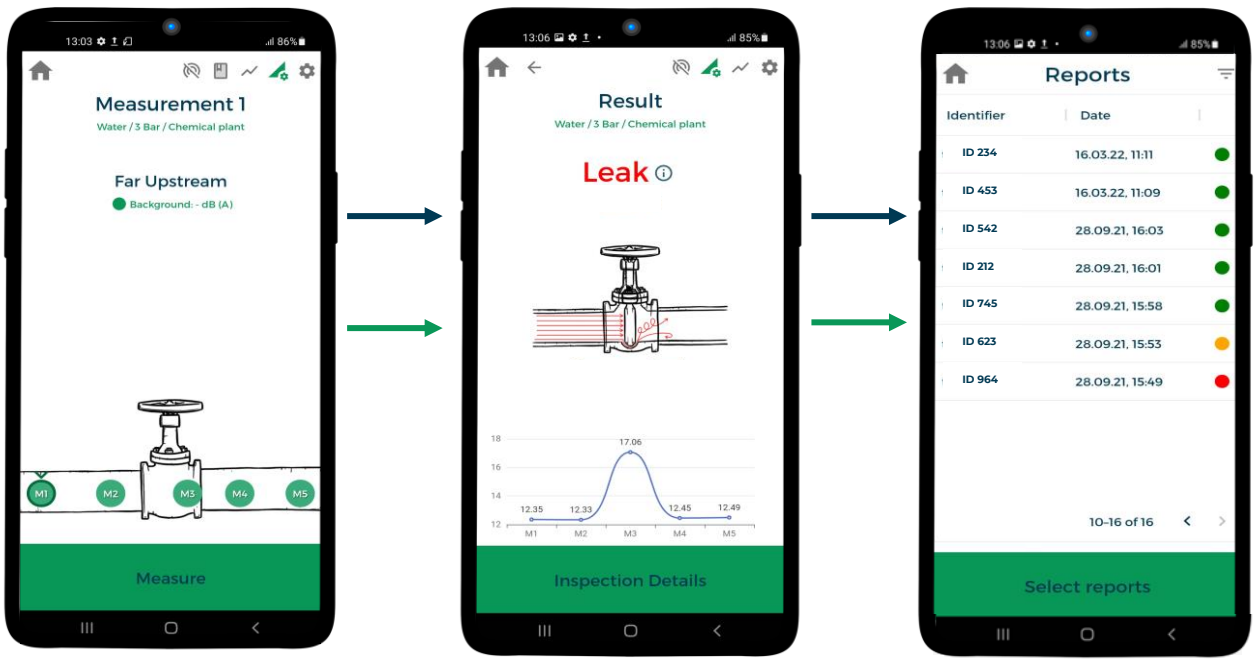
2 The Senseven App

First use case: Valve sense - leak detection in valves

Studies have shown that leaking valves represent a major source of profit loss, health and safety risks for employees, contamination and in the worst case environmental pollution.

Valve Sense supports you in identifying leaking valves long before they can cause any damage to your assets or force an unplanned shutdown.

The Senseven App is delivered on a conventional smartphone and does not require time-consuming training of employees due to its easy-to-use operation. This allows to flexibly inspect assets, detect potential defects within seconds and respond promptly.



The Senseven App provides:

- RFID tags to scan valve data quickly and easily
- Step by step software guided process
- Automated background noise detection
- Automated leak detection based on AI
- Auto-generated reports

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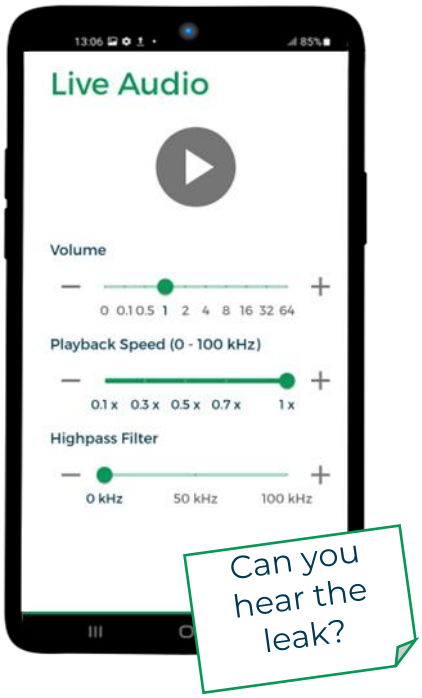
3 The Senseven Expert Suite

You would like to go into more detail of your measurements? No problem with the Senseven Expert Suite

Specific use cases e.g. such as blocking in pipes, cavitation or the location of noise could require to dive into some details during the measurement process. For experts using the inspection system, the Senseven App provides a live view as well as the possibility to listen into the audio signal while conducting the measurement.

Live view of RMS and dB values

Live audio during measurement



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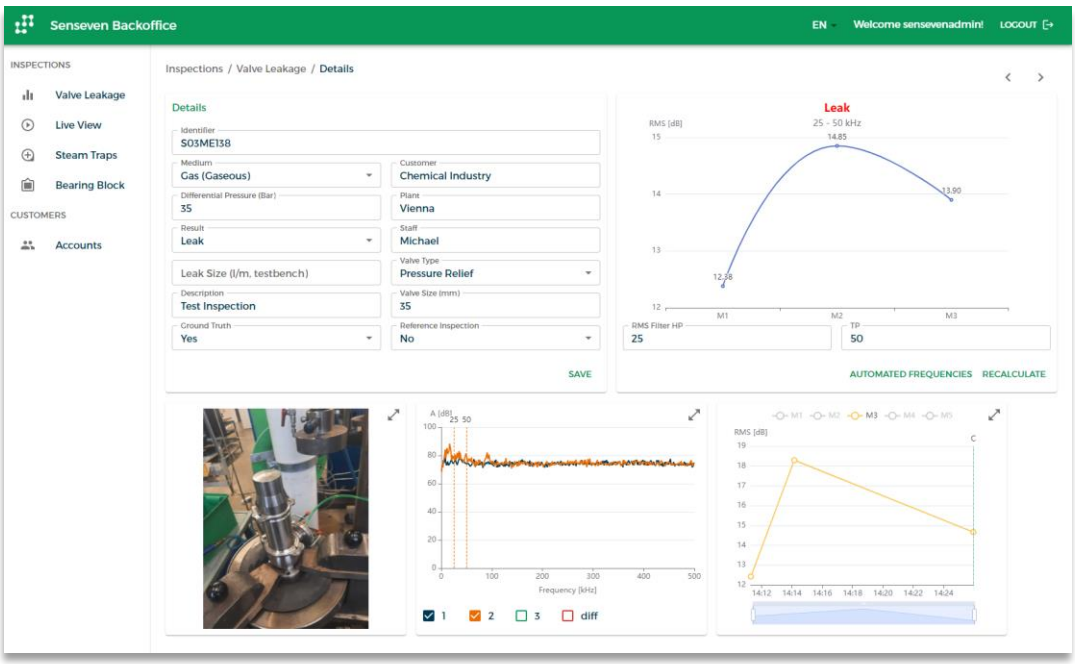
4 The Senseven Backoffice

Our cloud solution that will become the heart of your maintenance work

While conventional systems require data transfer with e.g. USB cable or memory cards, we offer a simple cloud solution that automatically synchronizes and stores all your measurement data in a structured way. Our solution includes a SIM card with enough traffic to upload all data to the cloud. No internet connection is necessary during the inspection, as soon as the phone has signal, all data are automatically synchronized.

The Senseven Backoffice will thus become a central place to get an overview of critical assets for maintenance managers.



Your benefits at a glance:

- Structured inspections from different locations/plants/machinery in one place
- Investigate all results directly in your browser. Filter, sort and analyze all your inspections and create an action plan
- Trend analysis over time if the same valve gets inspected multiple times
- Immediate auto generated reports based on ISO 18081
- Possibility to directly connect to other software systems

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Technical specifications

Component	Technical Details
Samsung Galaxy XCover Pro	Operating system: Android 9.0 Pie
	Size and weight: 165.2 x 76.5 x 9.94 mm, 217 g
	IP-certified: IP68 und Mil-810G
	Display: 6.3. Inch, LCD
	Working memory: 4 GByte
	Device memory: 64 GByte
	Back Camera : 25 Megapixel Front Camera: 13 Megapixel
On-board measurement software	Senseven developed measurement software, measuring RMS values of acoustic emission signals including live view for experts
	Language: German, English and Mandarin
AE sensors	Passive piezoelectic AE –Sensor
	Frequency range (f_{Peak}) {kHz) 100 to 450 (150)
	Capacity [pF] 350
	Operating Temperature [° C] -50 to + 100
	Ingress Protection Rating IP 40
	Size and weight: 20.3 mm x 23mm , 35 g
Seven one	Analogue Bandwidth: 20 to 500 kHz
	Input range: 100 dB_{AE} (opt. 94/134 dB_{AE})
	Noise floor (VS 150-M): <12 μV_{RMS} (95 – 300 kHz)
	Sampling rate / Res. : 2 MHz / 16 Bit
	Power consumption: < 0.7 W
	Power supply: 5V (USB powered)
	Degree of protection: IP 40
	Operating Temperature: -20 °C to + 60 ° C
	Size and Weight: 80,5 mm x 26,5 mm x 58 mm, 107 g

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