METRAVI PRO®

# INDUSTRIAL ACOUSTIC IMAGER

## PRO AI-10

## INTRODUCTION

The Metravi Pro AI-10 Acoustic Imager has been developed to visualise applications such as compressed gas leakage, local discharge detection in electrical equipment, space tightness testing, etc., using acoustic visualisation technology.

The use of nearly a hundred high-precision digital microphones improves measurement sensitivity, and can measure signals in the ultrasonic frequency band of up to 96 kHz.
In addition, excellent performance can be achieved in detecting high-frequency noise, including BSR (Buzz, Squeak, Rattle) noises.

The Metravi Pro AI-10 acoustic imaging system is a new type of noise source identification, positioning and test analysis system. It uses a high-sensitivity digital microphone to visualise the collected sound on the screen in the form of a colour contour map, effectively measure the sound field distribution, the sound image and the visible light video image are perfectly superimposed, forming a detection effect similar to that of a thermal imager on the temperature of an object.

It can quickly identify and locate steady-state, transient and moving sound sources, help people intuitively understand sound waves, sound fields, and sound sources, understand the locations and causes of noise generated by machinery and equipment, and then find ways to manage and control noise.


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## APPLICATIONS

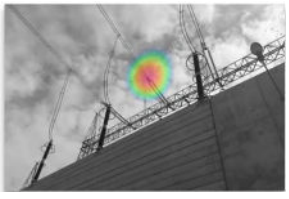
### VISUAL POSITIONING OF PARTIAL DISCHARGE IN ELECTRICAL EQUPMENT

Partial discharge causes deterioration of the insulation condition of medium and high-voltage equipment. If not detected, it causes equipment failure. In many cases, accidents occur after switching operations, which brings great hidden dangers to the personal safety of operators.

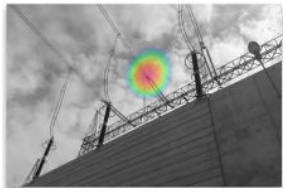
Hence, Partial Discharge is a common problem encountered by medium and high-voltage electrical equipment, which can cause damage to electrical equipment and even endanger the safety of on-site personnel.

Metravi's latest ultrasonic acoustic imaging technology turns partial discharge detection into real-time visual troubleshooting, which is fast, accurate and convenient, helping electrical maintenance personnel to check and handle partial discharge in a timely manner to ensure the normal operation of electrical equipment.

**Main classification of partial discharge detection :**

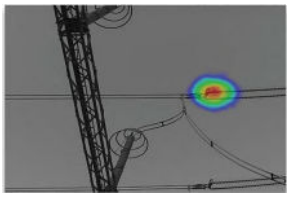


**Discharge on the surface of the exposed high-voltage porcelain sleeve or its internal components in the substation.**



**Discharge to air - usually harmless, but continuous discharge generates ozone and nitric acid, which erode the attached materials.**

**Corona discharge, automatic identification of discharge type from signal.**



**Insulator discharges, prolonged discharges can damage the insulator and may cause breakdowns.**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## APPLICATIONS

### VISUAL LOCATION OF GAS LEAKS IN PRESSURE PIPELINES

The handheld Metravi Pro AI-10 Industrial Acoustic Imager is equipped with nearly 100 high-precision digital microphones, enabling on-site maintenance personnel to quickly and accurately locate gas leaks in pressure piping systems, even in noisy environments.
Designed for use in complex production facilities, acoustic imaging technology blocks out most background noise that interferes with inspections and is easy to learn and operate. View Leakage Rate (liters/min or CFM) and Annual Energy Loss estimates in real time, making leak detection 10 times faster!

On the 5-inch LCD touchscreen, acoustic imaging and visible light images are perfectly superimposed, thereby helping maintenance personnel quickly locate the leak location. The simple and intuitive operation interface allows maintenance personnel to quickly identify and analyse the leaked audio frequency and filter out larger background noise.

With plant maintenance teams inspecting the entire plant in just a few hours during peak operations, the team can quickly and easily identify air leak repairs that need to be carried out to ensure efficient operations and reduce energy costs.
The device can also save and export images, videos for creating reports


**Main Unit**

**Rechargeable Lithium Battery**


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## APPLICATIONS

**PRODUCT QUALITY CONTROL :**

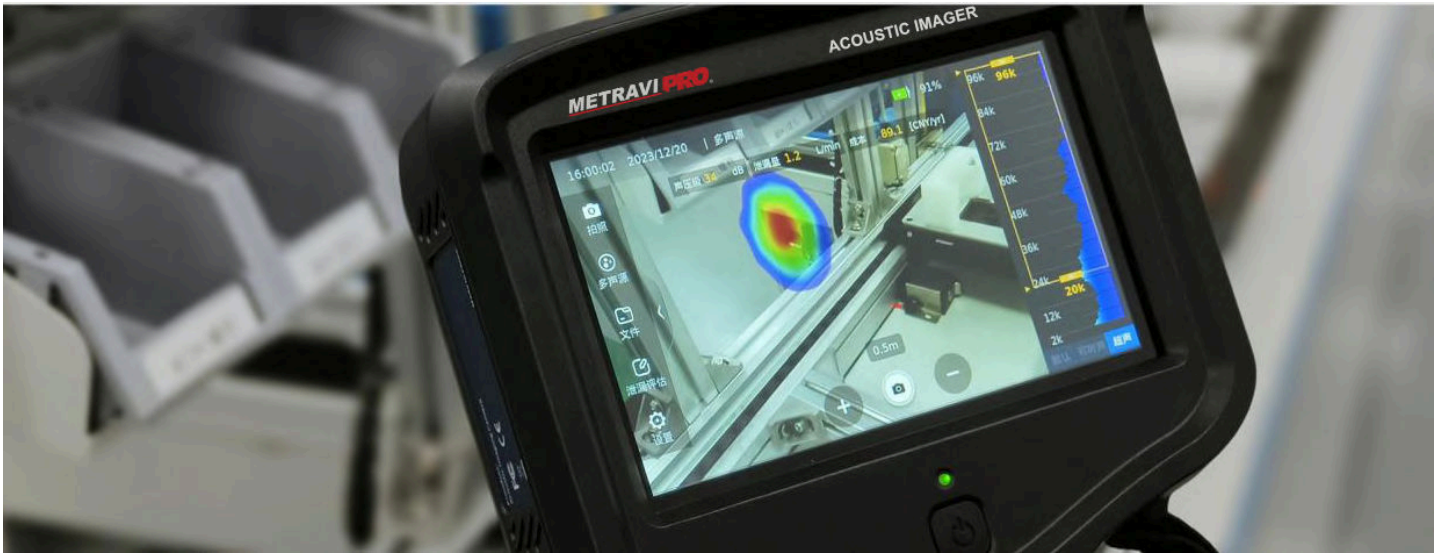
**High quality sound - high quality product**

Sometimes we find that high noise is not the main cause of discomfort. On the contrary, there are many relatively small sound sources below the main noise source, which are the disturbing noises. There are many such examples of this phenomenon in the automotive industry and home appliance manufacturing.

High-quality cars don't want noise such as "clatter, hiss", anywhere inside the car, and even at high speeds, the weakest syllables of high-quality music can be drowned out by car noise. Even though the structure isn't very heavy, we still want a full sound when we close the doors. This is why car manufacturers spend so much effort designing the acoustic characteristics of their products and eliminating interference.

Noise also plays an increasingly important role in the home appliance manufacturing industry. Often many high-end products can be easily identified by their "noble" sound. Noise is often associated with defects, "clicks, hisses", often causing customer dissatisfaction and complaints.

Of course, these are also all areas where acoustic imagers can be successfully used.

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## APPLICATIONS

**Acoustic imaging camera makes it easier to find flaws and defects**

In product quality control, it is often difficult for engineers to find product defects through abnormal sounds. Acoustic imagers are timely and can quickly and accurately find defects hidden in the soundscape. All changes are visible, and the visualisation also tells you where the noise source is located. Many of us have experienced the following: when the engine is running, even before the dashboard has reported an error, it always feels like something is wrong, the sound background is different, and some experienced drivers can hear what is wrong. In the industrial field, the situation is very similar: we can detect many defects just through the difference in sound.

**Quality assurance through noise imaging**

Defects in machinery and workshop equipment can often be detected by the noise they radiate. An experienced technician can listen for certain defects, and defective products can be screened out in the final quality control. So, how can we make test subjects so automated and more objective? Until now, long hours and expensive technology have been used to create the desired results. That's why these new, smarter ways of doing things are so urgently needed. The Metravi Pro AI-10 acoustic imaging system offers a unique solution to these problems.

**Other application fields**

Environmental noise monitoring, equipment noise control, acoustic measurements in indoor or open environments, etc., can all use the Acoustic Imaging System to measure the distribution of sound sources, taking advantage of its unique visualsation of imaging measurements.

Monitoring and distribution of environmental noise in power plants, workshops, nuclear power plants, etc., marking the location and intensity of noise generation, and helping to find ways to eliminate noise.

Highway noise analysis: measuring the driving noise of cars, trains, and high-speed railways, and analysing the distribution of noise, which is beneficial to the design of sound barriers and the adoption of noise reduction measures.

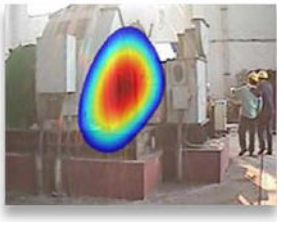
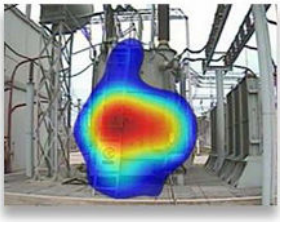
Monitoring the machine: After obtaining the feature database of various states of the machine by building a database, the machine state can be monitored in real time.

Noise evaluation: used to evaluate the noise quality of power stations, transformers, locomotives, etc., to report equipment noise magnitude, frequency range, etc. at fixed points and quantitatively.

It can be used to detect and analyse the sound distribution in the hall or theatre, and report whether the sound is uniform and whether there are acoustic dark areas in the form of a distribution chart. Fixed-point directional pickup of the speaking voice of a specific person can eliminate the interference of surrounding sounds and obtain clear speech of the presenter. The presenter no longer needs to carry a microphone.

It can be used to measure and evaluate the noise in a small-scale environments. It reports the noise intensity in the living area in the form of a distribution map, especially along the street, and specifically measures the intensity of each noise source (processing plant, experimental field, etc.) near the living area.



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## TECHNICAL SPECIFICATIONS

| | | |
|---|---|---|
| **Parameters** | Frequency Range | 2kHz to 96kHz |
| | Detection Distance | 0.3m to 120m |
| | Sound Pressure Range | 30dB-120dB |
| | Sensors (Microphones) | 96 Channel Digital MEMS |
| | Sensitivity | Detects 50CCM leakage at 3Bar pressure at a distance of 10 meters |
| **User Interface** | Display Type | 5-inch Touchscreen 800x480px |
| | Built-In Digital Camera | Fixed Focus Lens |
| | Camera Frame Speed | 25FPS |
| | Backlight Brightness | Adjustible |
| | Measurement Types | Ultrasound, audible sound, user-defined |
| | Leak Detection | Real-time display and evaluation of leakage and cost loss |
| | Partial Discharge Detection | Live Display PRPD |
| **Communication and Storage** | Internal Memory | 32GB |
| | Memory Type | Photo JPG, Video MP4 |
| | Communication | WiFi, USB |
| **Software** | Data Report Software | With SoundReporter PC software |
| **Internal Battery Pack** | Battery Type | Rechargeable lithium battery 7.4V, 3500mAh, can be replaced on site |
| | Battery Operating Time | ⩾3 hours (Depends on the site environment and working conditions) |
| | Charging Method | External dual slot charging |
| | Charging Time | 2-3 hours |
| **Environment Parameters** | Operating Temperature | -20°C - 50°C |
| | Storage Temperature | -40°C - 70°C (without battery) |
| | Operating Humidity | <95%RH |
| **Physical Parameters** | Product Size | 280x160x70mm |
| | Weight | 1.5kg |
| | Shell Material | Aluminium alloy, ABS |
| | IP Grade | IP51 |
| **Security** | Compliance Certifications | IEC, CE, FCC, ATEX |

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