How Does the CRY8124 Inspection Tool Work?

The CRY8124 acoustic imaging camera sets a new standard for sensitivity and efficiency: Pinpointing leaks, Identifying electrical partial discharge and detecting mechanical deterioration.

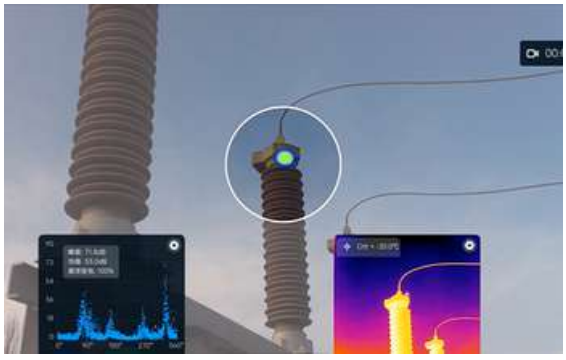
Detection of Gas Leaks

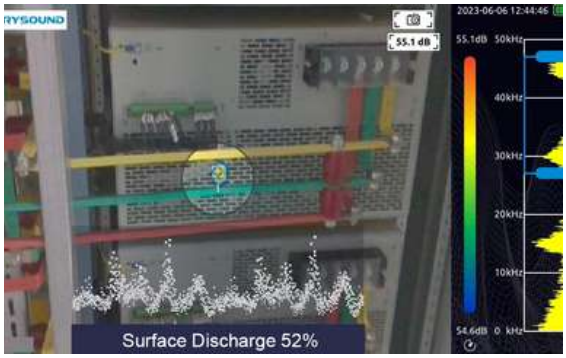
When pressurised gas escapes through a leak, it generates ultrasonic sound waves beyond the range of human hearing. The CRY8124's array of 200 microphones captures these high-frequency sounds.

By employing beamforming techniques, (focus on sound from a specific direction while filtering out background noise from other areas) the device accurately determines the origin of the sound, allowing for precise localisation of the pressurised air or gas leak.

The camera then overlays this information onto a visual image, providing a real-time acoustic map that accurately and instantly highlights the leak's location.

Detection of Partial Discharges





Partial discharges are small electrical sparks occurring within insulation systems of high-voltage equipment, often indicating insulation degradation. These discharges emit ultrasonic signals.

The CRY8124 detects these ultrasonic emissions, enabling the identification and localisation of PD events. Its advanced software interface not only pinpoints PD locations but also assists in classifying the type of partial discharge, aiding in maintenance decisions.

If integrated with a thermal imaging camera, it would enhance its capabilities by detecting temperature variations along with ultrasonic emissions. Here's how it would work:

Integration of Thermal Imaging

Gas Leaks

Some gases cause temperature differences when they escape, either cooling down or heating up the surrounding area. A thermal camera could visualise these temperature changes alongside acoustic detection for a more comprehensive leak analysis

Partial Discharge

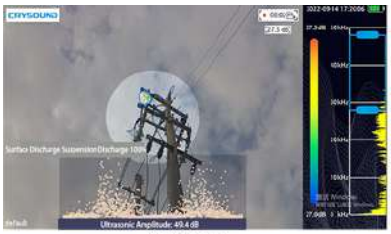
PD events often generate heat due to energy dissipation. A thermal camera could help identify hotspots in electrical components, adding another layer of diagnostics to pinpoint insulation degradation.

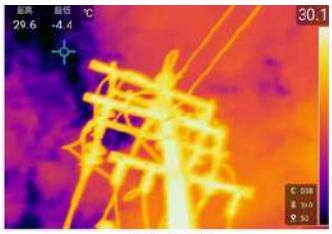
Mechanical Faults

Bearings, motors, and other mechanical systems experiencing wear or friction often heat up before failure. A thermal imaging overlay would allow early detection of overheating components.


Acoustic Imager

Infrared Imager


Acoustic Imager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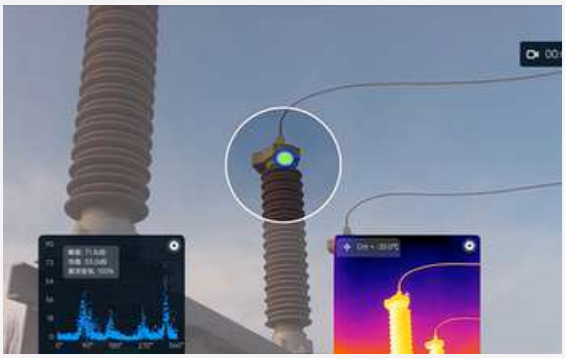

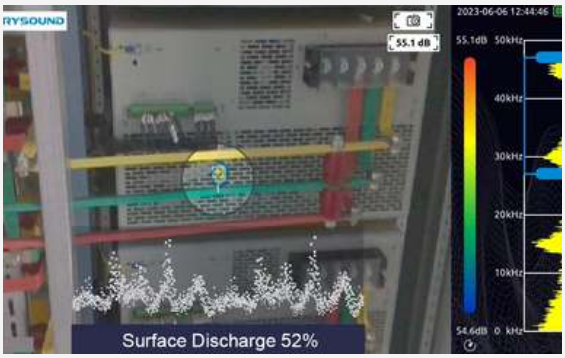

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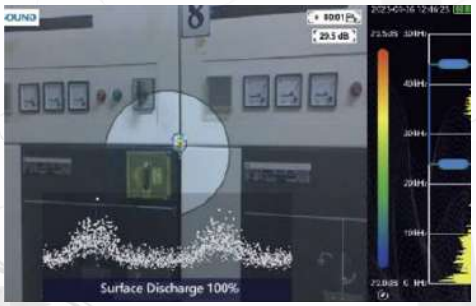
The CRY8124 leverages its high-sensitivity microphone array and sophisticated processing algorithms to instantly convert ultrasonic emissions from gas leaks and partial discharges into visual representations.

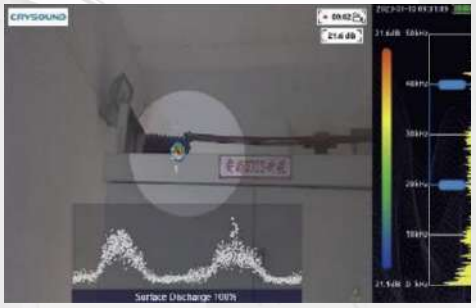
By combining acoustic imaging, beamforming, and potentially thermal imaging, the CRY8124 provides a precise, real-time diagnostic tool for air and gas leaks, electrical faults, and mechanical issues.

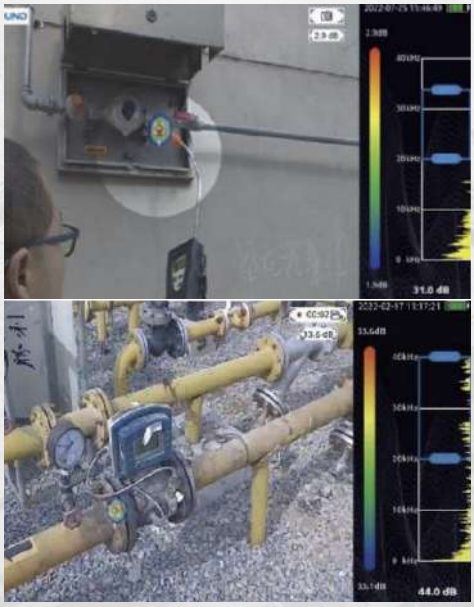
Application Examples

Transformer Substation

- Switch Cabinet: Detects partial discharge through the observation or maintenance port on the cabinet door.
- Wire: Acoustic imaging detects weak suspension discharge in 110kV substation cables
- High Voltage Chamber Insulator: Handheld acoustic imagers enable safe, remote detection of components, protecting inspection personnel
- Switch Insulator: Acoustic imagers quickly detect surface discharge on switch cabinet porcelain columns.







Oil and Gas

- Urban Gas: High-pressure leaks at gate stations can cause major safety risks
- Rural Gas: Acoustic imagers enable efficient inspection of long Pipelines reducing time, labor, and missed detections.
- Gas Field: Complex pipelines and numerous detection points make traditional methods slow and prone to leaks.
- Gas Station: Acoustic imagers boost leak detection rates in filling areas outperforming traditional soap water and listening methods.

Metallurgical

- Steelmaking: Acoustic imagers can accurately detect leaks at the high-temperature nozzle connection, where soap water isn't suitable
- Gas: Gas overhead pipelines are generally difficult to inspect by observing whether black liquid seeps out at the joints
- Oxygen, Nitrogen, and Argon Gas: Traditional soap water inspections are slow and limited, allowing gas leaks. Acoustic imagers help reduce economic losses by detecting leaks more efficiently
- Substation: Partial discharge phenomena in the power system equipment of the station can affect safe operation