



**ULTRASOUND SOLUTIONS FOR  
CONDITION MONITORING,  
LEAK DETECTION, AND  
ELECTRICAL INSPECTION**



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## ULTRASOUND DETECTION

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The receiver detects ultrasound produced by mechanical, pneumatic, hydraulic, and electrical systems and converts it into the audible range for interpretation and analysis. Changes in the amplitude and characteristics of the ultrasound are easily detected in noisy plant environments. Leaks are easily pinpointed. Equipment problems are diagnosed even earlier than other technologies such as infrared inspection and oil analysis. Bearing lubrication monitoring with ultrasound complements condition monitoring with vibration sensors.

## APPLICATIONS

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### Motor Bearing and Gearbox Monitoring

Easily distinguish the different sounds produced by motor bearings in different conditions such as under lubrication, over lubrication, and excessive wear.

### Leak Detection

Indicate and locate pressurized and non-pressurized system leaks of any type of gas.

### Electrical Safety Inspection

Detect arcing, tracking, and corona discharge in low, medium, or high voltage settings.

### Valve and Steam Trap Monitoring

Detect internal by-pass leaks and diagnose operating condition.



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Wilcoxon Sensing Technologies 

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## ULTRASOUND RECEIVER

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### **Complements vibration monitoring**

Add ultrasound detection to your condition monitoring routine to hear bearing over- and under-lubrication and other conditions that lead to bearing wear. In some cases, ultrasound detection can pinpoint troubles before vibration monitoring.

### **Wide range of applications**

In addition to bearing monitoring, the same receiver supports leak detection, valve and steam trap monitoring, and electrical arcing and corona discharge detection.

### **Finds all turbulent flow leaks**

The most sensitive detector on the market today for compressed air/gas, vacuum, and valve leak detection. Unlike traditional "leak detectors," which detect a characteristic of a specific gas, the ultrasound receiver detects the turbulent airflow of any compressed gas.

### **Easy to use**

"Point and shoot" - just turn the receiver on, adjust the sensitivity, and begin testing.

### **Long battery life**

A single 9-volt battery powers the receiver for more than 45 hours of continuous operation.

### **Standard or intrinsically safe models**

Intrinsically safe models can be used in hazardous areas.

### **Trusted in the world's most demanding applications - and beyond**

The same ultrasound receiver serves on the International Space Station, is used by Boeing, and was selected by the Navy, Army, and Air Force.

[See the complete specifications.](#)



# BEARING CONDITION MONITORING

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## Under Lubrication

When bearings lose their lubrication, friction from the metal-to-metal contact leads to excessive wear. The first indication is through ultrasound. The RMS (overall average amplitude) level rises dramatically. A comparison to the bearing's history and a previously set baseline will indicate lubrication is required.

## Over Lubrication

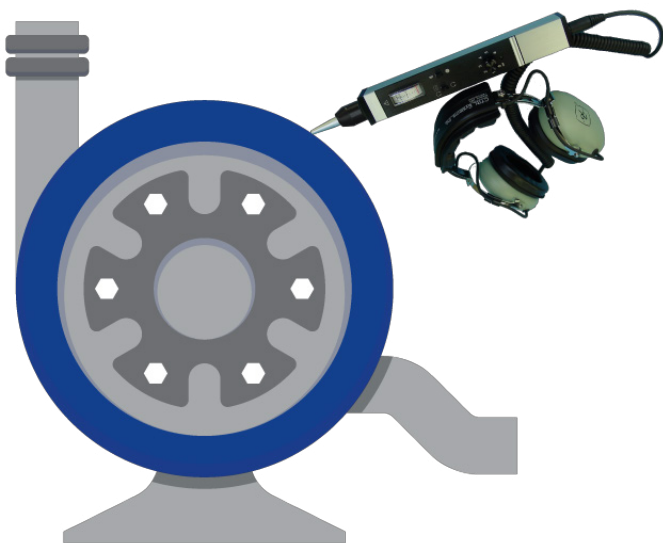
When a bearing has too much lubrication, it will lead to increased pressure and excessive heat in the bearing housing and decrease the life expectancy of the bearing. The RMS will indicate that no ultrasound is being produced.

## Excessive Wear

As bearings wear, subtle impacts are generated by pitting, spalling, and damage to the inner or outer race. With continued wear, these impacts register an increasing "Events Per Second" (EPS). Replacement of the bearing can be scheduled during a routine shutdown before a catastrophic failure occurs.

## Other Mechanical Operations

All mechanical equipment produces ultrasound. Comparing the present to the historical condition will make apparent any deviation from the baseline.



*To hear structure-borne ultrasound created by bearings, gears, pumps, valves, and cylinders, the receiver is used with solid probes, which make direct contact with the machine being monitored.*

## UDK-CM CONDITION MONITORING KIT

Receiver

Headset

Solid probe set:

3"

5"

8"

13"

1yr subscription, cloud-based condition monitoring app  
(optional additional kits can be subscribed)

Heavy-duty carrying case

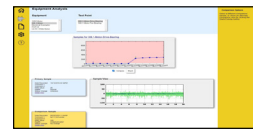
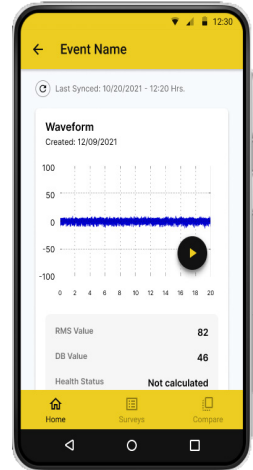


## CLOUD-BASED MONITORING APPLICATION

Analyze, trend, and report on the condition of the critical production equipment in manufacturing facilities. The InCTRL app records the ultrasound directly from the receiver, using a standard Android smartphone, and instantaneously uploads it to the cloud-based program for historical comparison and analysis. The app magnifies communication and integration throughout the organization's decision makers.

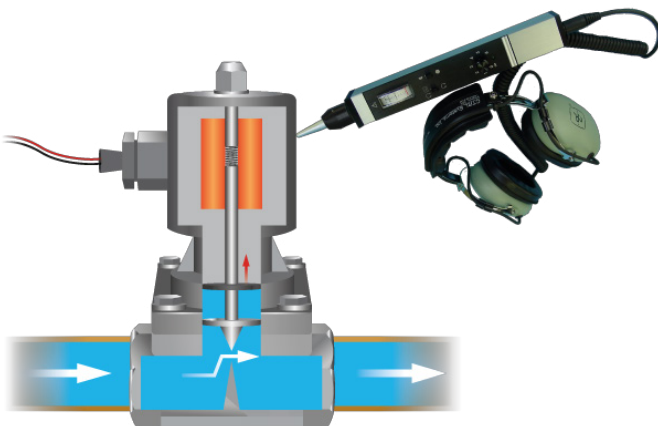
### Instantly see, hear, monitor, and diagnose

- Compare ultrasound readings of similar equipment.
- Set a baseline and trend the ultrasound readings over time.
- Set the RMS threshold level and get an e-mail alert when the RMS rises too high.
- Bearing health diagnoses include "normal", "under lubricated", "suspect", or "questionable".
- Stack and overlay waveforms to detect early signs of equipment wear.
- Detect harmonics, mechanical looseness, corona, and arcing (electrical inspection) with built-in FFT.
- Create reports for cost justification, meetings, and long-term planning.
- Deploy at multiple locations for corporate-wide implementation.
- Share data with other departments or with multiple plants around the world.



## VALVE & STEAM TRAP MONITORING

Reduce inspection time for hydraulic lines and systems, valves, and steam traps. Save money by detecting internal bypass leaks with a single-point inspection.



### UDK-VL VALVE AND STEAM TRAP MONITORING KIT

Receiver

Headset

Solid probe set:

3"

5"

8"

13"

Heavy-duty carrying case

*To hear structure-borne ultrasound created by leaky valves, the receiver is used with solid probes in direct contact with the machine.*

The UDK-CM Condition Monitoring Kit includes all components for valve and steam trap monitoring.

## LEAK DETECTION

The receiver is sensitive enough to detect all turbulent flow leaks. Turbulence is produced by many different variables, including the size or shape of the hole, pressure (vacuum or positive), humidity, temperature, direction of flow, and more.

### Compressed Air Energy Savings

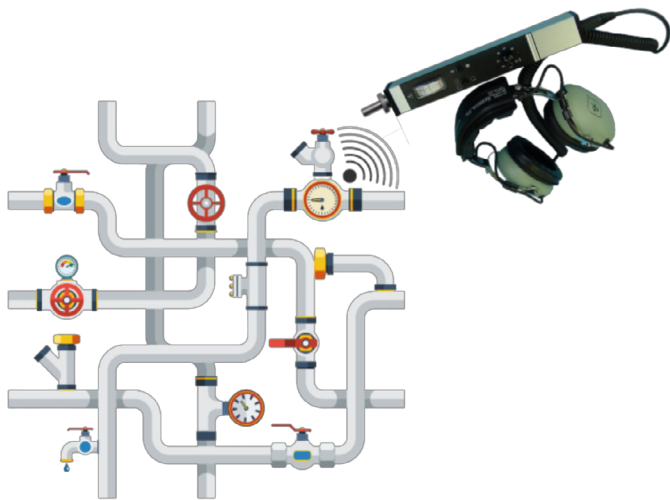
Leaks account for 20% - 30% of the energy usage of a compressor.

### HVAC Monitoring

Ultrasound is not affected by wind, making it ideal for detecting HVAC leaks.

### Any Type of Gas

Unlike traditional “leak detectors”, which detect a characteristic of a specific gas, the receiver can detect leaks of any type of gas. For an expensive gas, like nitrogen, finding one leak can result in a 100% ROI.



*To hear airborne ultrasound created by turbulent flows, the receiver scans the exterior of the asset for leaks. Acoustic probes and concentrators allow the operator to remain at a safe distance from the asset being monitored, up to 150' away.*

### UDK-LK LEAK DETECTION KIT

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Receiver (optional Intrinsically Safe certification)

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Headset

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Concentrator set:

Acoustic tip  
Mini concentrator  
Large concentrator

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Acoustic extension probe set:

Adapter  
Metal probe, double threaded end, 12" (2)  
Metal probe, single threaded end, 12"  
Polycarbonate probe, 12"

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Aluminum acoustic probe, 1"

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Heavy-duty carrying case

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# ELECTRICAL SAFETY INSPECTION

Electricity escaping in high voltage lines or jumping across gaps in electrical connections disrupts the molecules in the air and produces ultrasound. The receiver detects corona discharge, tracking, and arcing from a safe distance. Because it can detect internal partial discharge, there is no need to remove panels. Corona discharge is a major contributor to energy loss and radio frequency interference.

- Detect problems when no heat is present, with or without infrared.
- Identify loose connections and insulation loss.
- Use in high-, medium- and low-voltage applications.



*To hear airborne ultrasound created by electrical arcing and corona discharge, the receiver is used with acoustic concentrators that allow the operator to remain at a safe distance from the electrical cabinet, up to 150' away.*

## UDK-EI ELECTRICAL INSPECTION KIT

Receiver

Headset

Concentrator set:

Acoustic tip

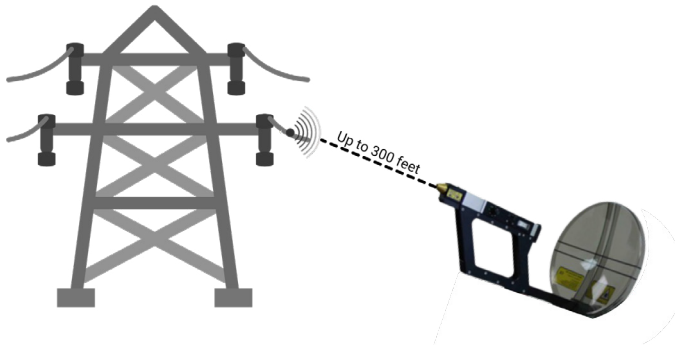
Mini concentrator

Large concentrator

Polycarbonate acoustic probe, 12"

Heavy-duty carrying case

Optional range extender (300 feet)



*For electrical inspection of power lines, the range extender parabolic dish lets the operator detect airborne ultrasound up to 300' away.*



## TRAINING

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Ultrasound practitioners should develop proper techniques to incorporate methods and procedures that lead to reliable and repeatable ultrasound inspection results.

### **On-Site Ultrasound Training**

This comprehensive training program includes extensive classroom training as well as hands-on equipment training. This program was designed to bring the classroom to you while providing input and practice on your equipment. On-site training and implementation enhance the potential savings opportunities from ultrasound monitoring.

### **Ultrasound Certified Training Level 1**

Level 1 training, based on ISO 29821 and ISO 18436, teaches methods and requirements for carrying out condition monitoring and diagnostics of machines: measurement, data interpretation, and assessment criteria. The ultrasound practitioner will develop proper techniques and procedures that lead to reliable and repeatable ultrasound inspection results.



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