HIKMICRO ACOUSTIC LEAK DETECTOR AD21P PRODUCT INTRODUCTION

PROFESSIONAL TOOLS FOR DETECTING INDOOR LEAKS

INDUSTRIAL PRODUCT | 2025.Q1

PRODUCT CATEGORY

HIKMICRO

Thermal

Handheld

Fixed

Firefighting

Explosion-proof

Acoustic

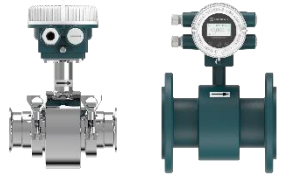
Acoustic

Software

Software

Instrument

Electromagnetic Flowmeter



Pressure Transmitter

Pyrometer

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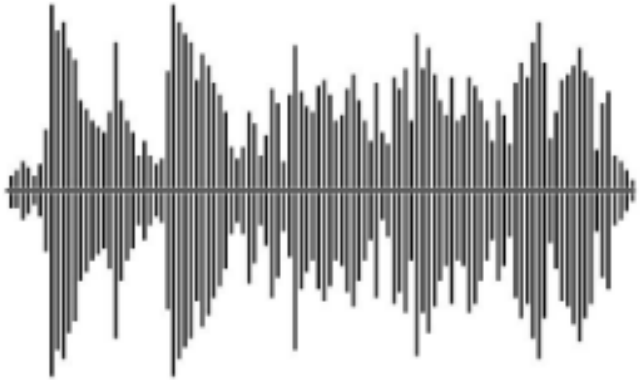
About Sound

Sounds are all around us. Most around us produce sound. What we can't hear, doesn't mean there isn't any sound produced.



We measure Sound in Bandwidth.
The unit that we use for **Bandwidth is Hz.**

A dog's hearing range is from **67 Hz to 45 kHz.**
The human ear can hear in the field of 20Hz-20kHz. However, most adults over 25 cannot hear sounds above 16K.
When you blow the dog whistle, you cannot hear any whistle at all, but dogs can and will come running to you when you blow the dog whistle.
That is because the dog whistle emits a pitch of 23 kHz to 55 kHz when blown.

Sound is also everywhere in the indoor environment, especially the sound of water flowing. Using a leak detector can help you discover sounds that are not audible to the human ear, helping you to quickly locate a leak, whether it's underground, or inside a wall.

AD21P can help you identify risks in time, fix problems quickly, and improve your work efficiency.

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AD21P - Overview

Professional Tools For Detecting Indoor Leaks

The HIKMICRO Acoustic Leak Detector AD21P is a high-performance device designed for technicians and plumbers to find leaks in indoor plumbing, water service, and residential or commercial properties. With the new HIKMICRO SuperDetect function, the AD21P can quickly locate water leaks, and with the handheld sensor and pick-up sensor, the AD21P can meet most of the indoor water leakage detection scenarios. Furthermore, it can reducing resource waste and property loss.

Basic Parameters	AD21P
Frequency Range	150~7500Hz
SuperDetect	Yes
Amplification	Manual adjustable
Band Pass Filters	Indoor low-frequency 150Hz to 3000Hz Indoor mid-frequency 3000Hz to 6000Hz Indoor high-frequency 4500Hz to 7500Hz Indoor all-pass 150Hz to 7500Hz
Display	1024 × 600 Resolution，7"LCD Touch Screen
Screen Brightness	Manual/Auto
Storage Media	Built-in EMMC(4GB)
Image Storage Capacity	Approx. 60,000 Images, viewable only on PC
Image Format	JPEG
Audio Storage Capacity	Approx. 20 hours, viewable only on PC
Audio File Format	.wav
Working Temperature Range	-10 °C to 50 °C (14 °F to 122 °F)
Drop Test Height	1.2 m(3.93 ft.)
Battery Type	Rechargeable Li-ion Battery
Battery Operating Time	11h
Battery Charging Time	4h to full charge
Protection Level	Main Unit:IP40； Hand held sensor:IP54； Pick-up sensor:IP66；

High-sensitivity Sensors

HIKMICRO SuperDetect

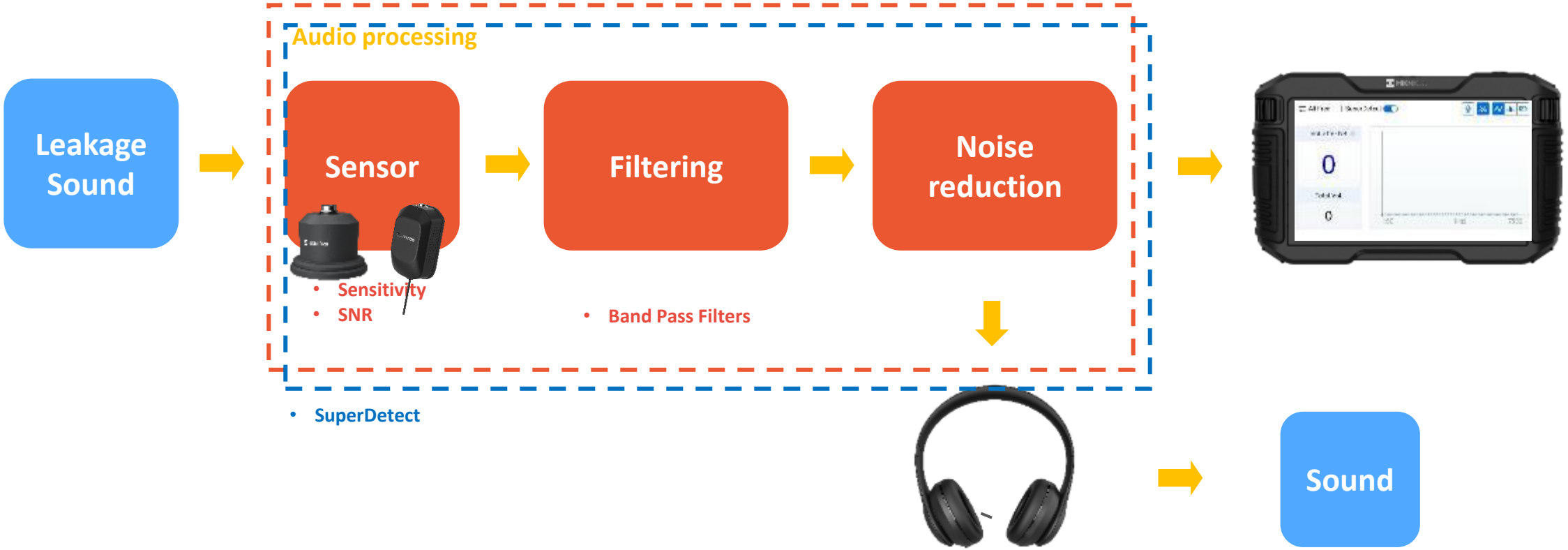
Intelligent Noise Reduction

7"LCD Touch Screen

AD21P – Working Principle

It’s main working principle of AD21P is to use the propagation characteristics of sound waves and shock waves, when the water flows through the leakage point in the pipeline, it will produce **specific sound waves and shock waves**, and the **detector receives and analyzes** these sound waves and shock wave signals to determine the location of the leakage. Through sound processing techniques noise reduction, water leakage sound waves are detected and converted into sounds and numbers that **can be heard by the human ear**.

The new **SuperDetect** feature allows people who don't have a lot of experience in determining leaks to still find them quickly. SuperDetect extracts the sound of a valid leak using an intelligent algorithm, and **the results are presented directly on the device screen**.



AD21P – SuperDetect

Intelligent Leak Detection Algorithm

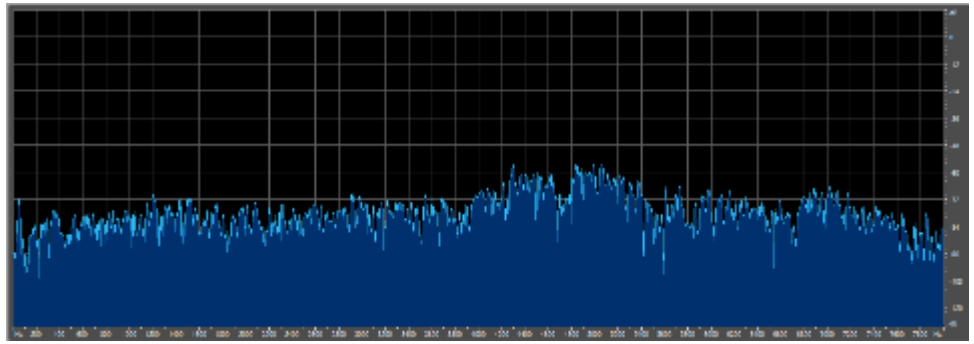
In the field of leak detection, efficiency and precision have always been key concerns. Even with professional leak detection tools, inspectors still need to accumulate a lot of experience to quickly and efficiently determine leaks. SuperDetect intelligent algorithms, through the analysis and learning of a large number of water leakage sounds, can easily locate leaks during the inspection process.

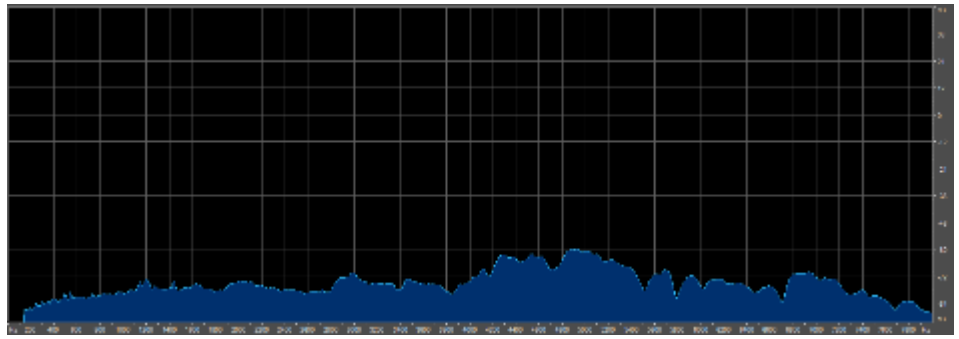
Core Technology and Implementation of SuperDetect

The intelligent detection capabilities of SuperDetect, integrated into the HIKMICRO AD21P, are powered by a robust algorithm library and a massive database of leak sound characteristics.

1 **Spectrum Analysis and Intelligent Algorithms**:

Through in-depth learning of the typical leak sound frequency range (150Hz-7500Hz), SuperDetect not only captures sound intensity but also focuses on analyzing the frequency characteristics of potential leak areas.





AD21P – SuperDetect

The Intelligent Assistant Revolutionizing Leak Detection

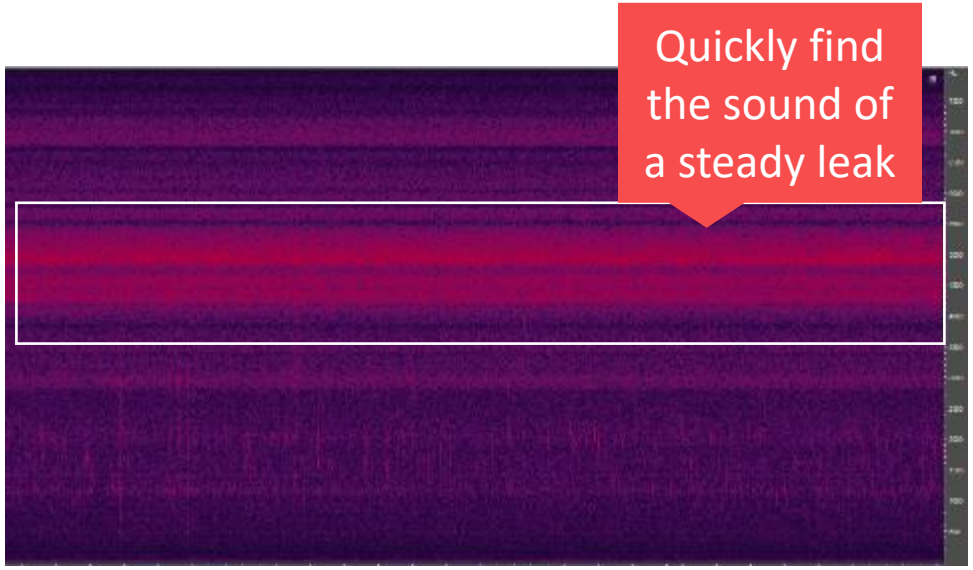
Core Technology and Implementation of SuperDetect

The intelligent detection capabilities of SuperDetect, integrated into the HIKMICRO AD21P, are powered by a robust algorithm library and a massive database of leak sound characteristics.

2 Full-Band Precision for Effortless Leak Localization

With SuperDetect activated, the system seamlessly switches to full-band mode (150-7500Hz), analyzing multi-point sound data to prioritize suspected leak areas.

By moving beyond the traditional “loudest sound equals leak” logic, it precisely pinpoints the exact location of leaks, ensuring efficient and accurate detection, even for faint or complex sounds.



By analyzing the audio file, the SuperDetect feature grabs the location where there is a steady sound transmission, which is usually the leak.

AD21P – SuperDetect

The Intelligent Assistant Revolutionizing Leak Detection

Advantages and Benefits of SuperDetect

1

Lowering the Technical Barrier for Users

Traditional leak detectors require experienced professionals to identify leak points. With SuperDetect, even novice users can achieve professional-level results through simple operations, significantly reducing the skill threshold.

2

Improving Efficiency and Reducing Detection Time

SuperDetect allows the device to automatically identify leaks, eliminating the need for prolonged data collection or relying on headphones to listen for sound. This automation makes leak detection faster and is especially useful in urgent scenarios requiring rapid troubleshooting.

3

Minimizing Errors and Enhancing Accuracy

By analyzing sound frequency, intensity, and spatial characteristics, SuperDetect reduces misjudgments caused by environmental noise or multi-point interference, ensuring reliable and accurate detection results.

AD21P – SuperDetect

The Intelligent Assistant Revolutionizing Leak Detection

How to Use SuperDetect

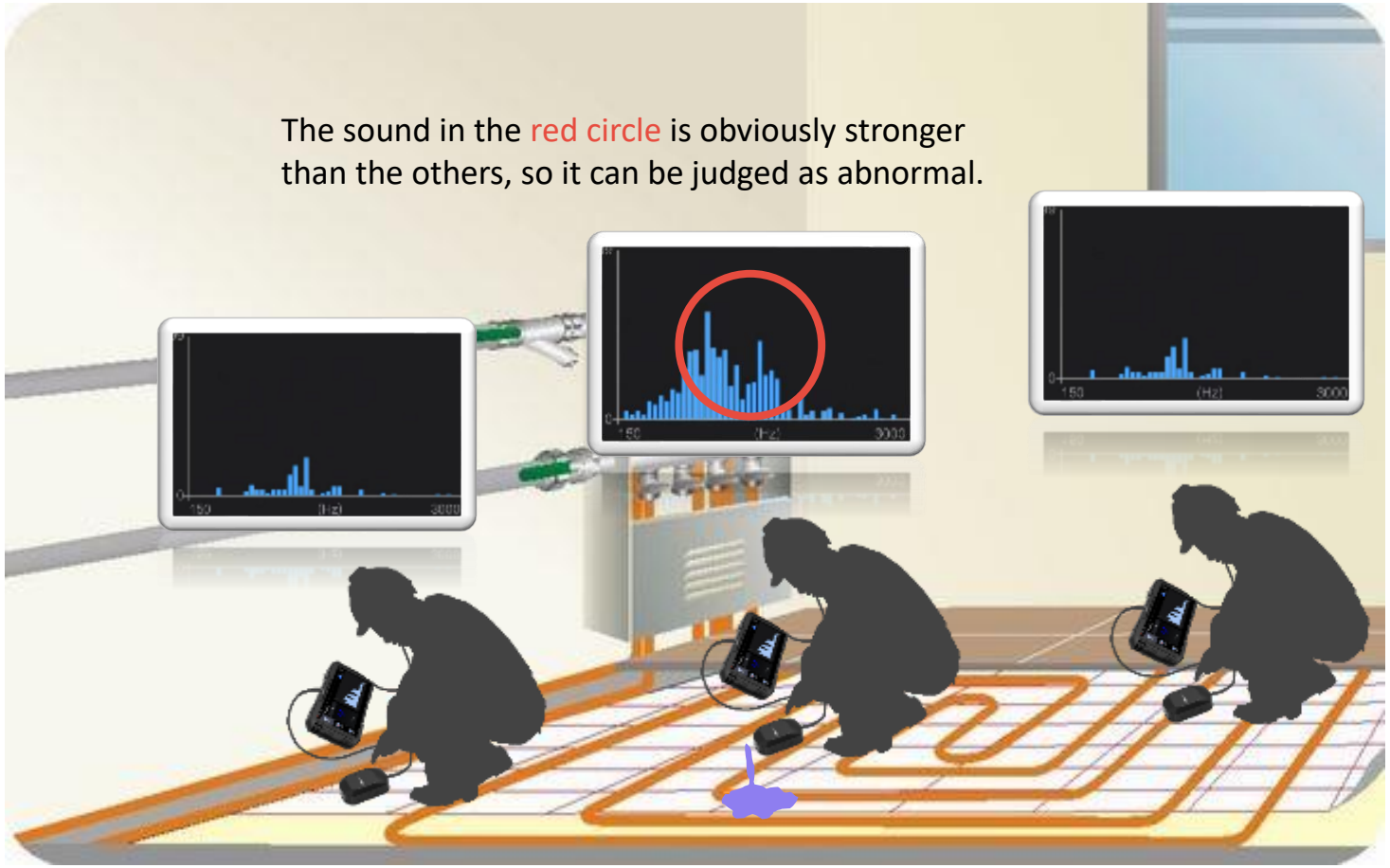
Users only need to **activate the SuperDetect** feature in the device settings, which is available in both quick inspection mode and inspection modes.

Once enabled, the device will automatically switch to full-band frequency detection. Simply collect sound data around the suspected leak area, and the device will perform intelligent analysis to locate the leak.

AD21P – Two Inspection Modes For Fast Leak Location

Quick Inspection Mode

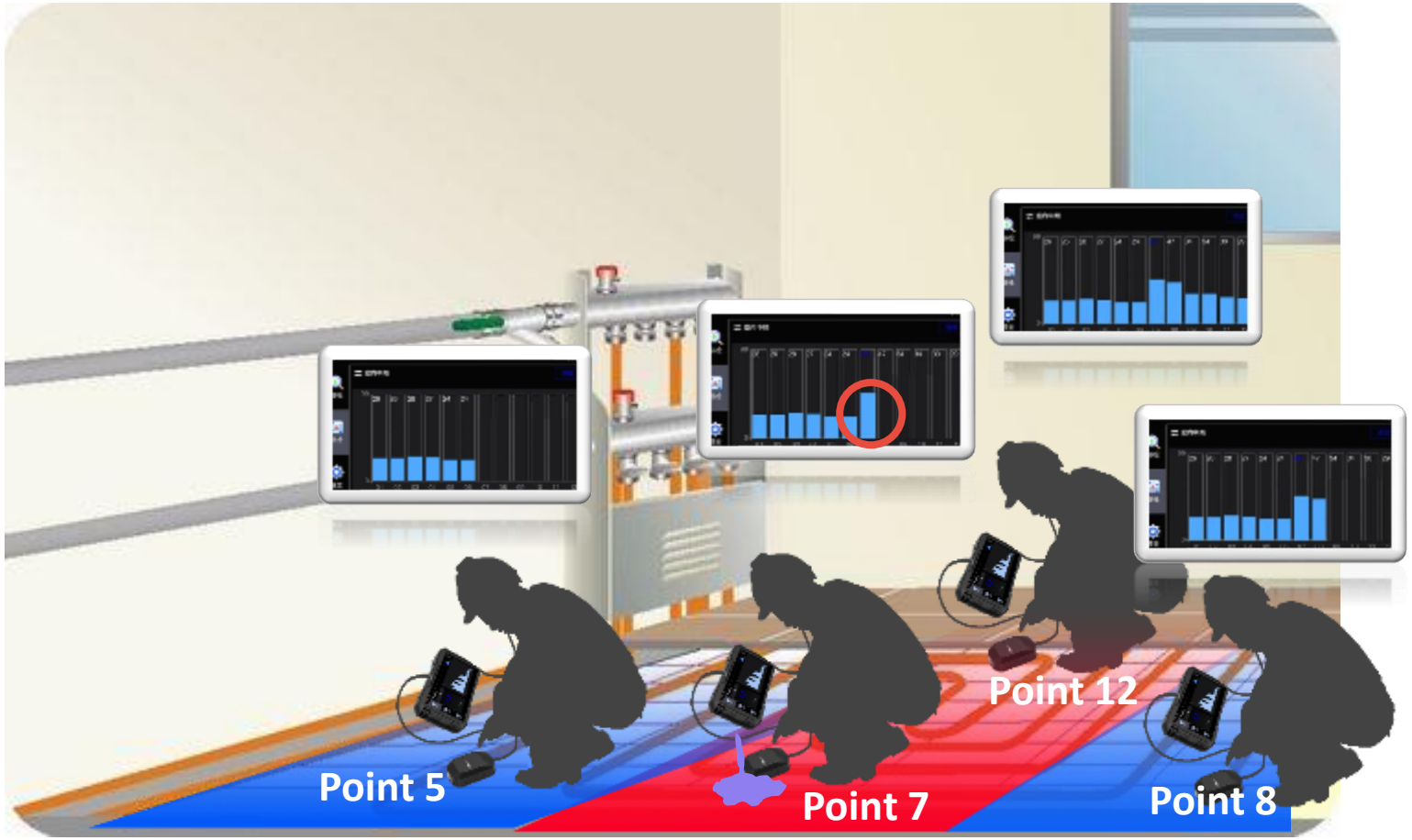
Quickly locate the scope of the leakage point, through real-time digital and image changes for investigation.
It can support SuperDetect with three display modes: figure, bar chart and line chart, suitable for different users' habits.

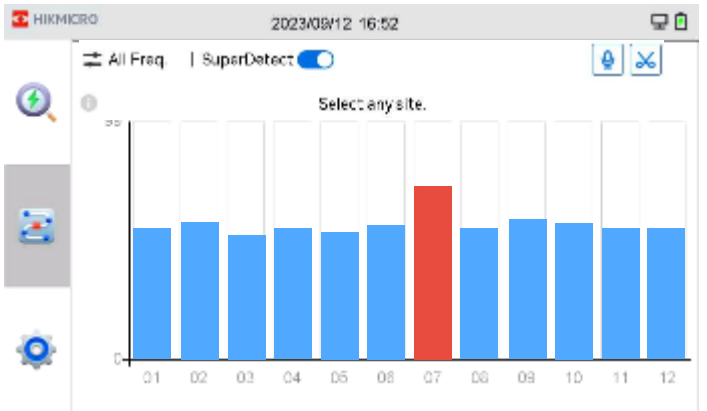


AD21P – Two Inspection Modes For Fast Leak Location

Inspection Mode

Inspection mode can detect the floor and wall. Record the values of up to 12 areas. After finishing the inspection, AD21P with SuperDetect will automatically determine the suspected leakage points, making the leakage detection work more accurate.





After finishing the detection, based on sound intensity, the AD21P can automatically determine the suspected leakage point 7.
If a point needs to be re-measured, individual points can be re-tested or all of them can be cleared for measurement.

AD21P – Four Indoor Band Pass Filters

Through intelligent algorithms, AD21P is optimized for different sound bands in indoor leak detection scenarios, picking the right gear to quickly locate the location of the leak.

Indoor
Low-frequency
150 to 3000Hz

Indoor
Mid-frequency
3000 to 6000Hz

Indoor
High-frequency
4500 to 7500Hz

Indoor
All-pass
150 to 7500Hz

How to Choose Leakage Detection Level Switch

Routine water leakage:
Indoor Mid-frequency can cover 80% of the indoor water leakage frequency band.

Difficult water leakage:
First, select the all-pass to refer to the leakage frequency value, and then use the low, mid, and high frequency to measure.

AD21P – Easy To Ues, More Flexible Setting

7“LCD Touch Screen Display

1024×600 resolution, results are presented directly. Convenient to use with gloves, and more flexible parameter settings. Supports screen brightness adjustment, daytime and nighttime mode switching.

Dual Wave Wheels

The left volume wheel can adjust the headset volume by 10 levels, and the right leakage detection level switch the frequency range according to the detection environment.

AD21P – High Quality Listening Experience

Rugged & Durable Design

Features IP66-rated form factor, passes strict drop tests up to 1.2 meters (3.93 feet) and comes with a two-year warranty.

Main Unit: IP40
Piezo Ceramic Handheld Sensor: IP54
Piezo Ceramic Pick-up Sensor: IP66

High-quality Noise-canceling Headset

HIKMICRO AD21P with ergonomic design, long time wear without fatigue.
Intelligent noise reduction, you can clearly hear the sound of underground water flow.

11 Hrs. Continuous Runtime

Built-in rechargeable battery and 4h battery charging time to full charge allow the camera up to 11 hours of continuous operation.

Hearing Protection

The HIKMICRO AD21P supports active hearing protection, when affected by large noise beyond the human ear to withstand decibels, the device automatically stops sound playback to avoid hearing damage.

AD21P– Form Factor

Headset Jack
Connect the headset to the device

Reboot Key
Press to restart the device

Sensor Interface
Connect the handheld sensor or pick-up sensor to the device

Sound Collection Button
Hold to start receiving the audio signal from the handheld sensor or the pick-up sensor and release to stop receiving the audio signal

Type-C Interface

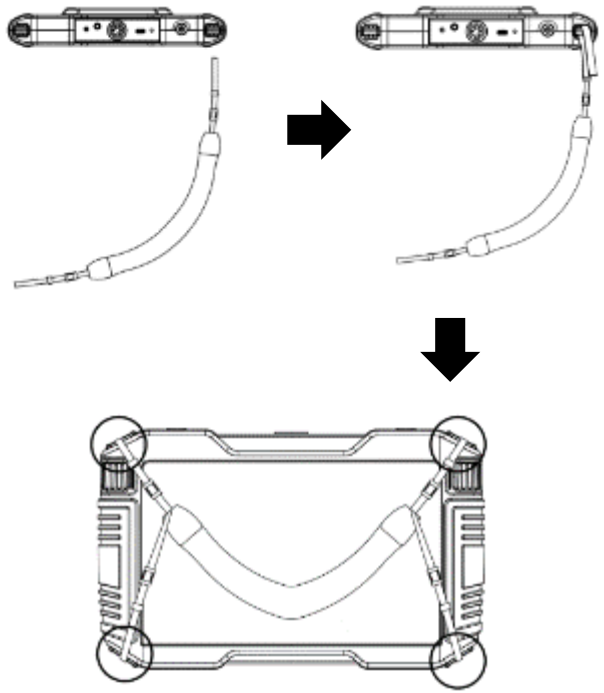
Volume Wheel
Adjust the headset volume

Touch Screen
Shows the live view interface

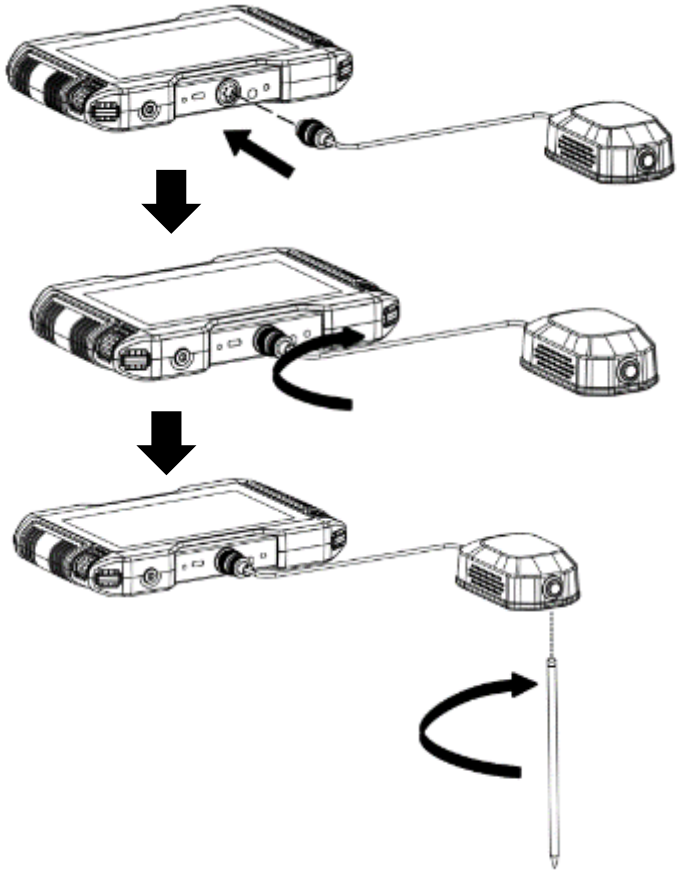
Leakage Detection Level Switch
Switch the frequency range according to the detection environment

AD21P – How To Mount

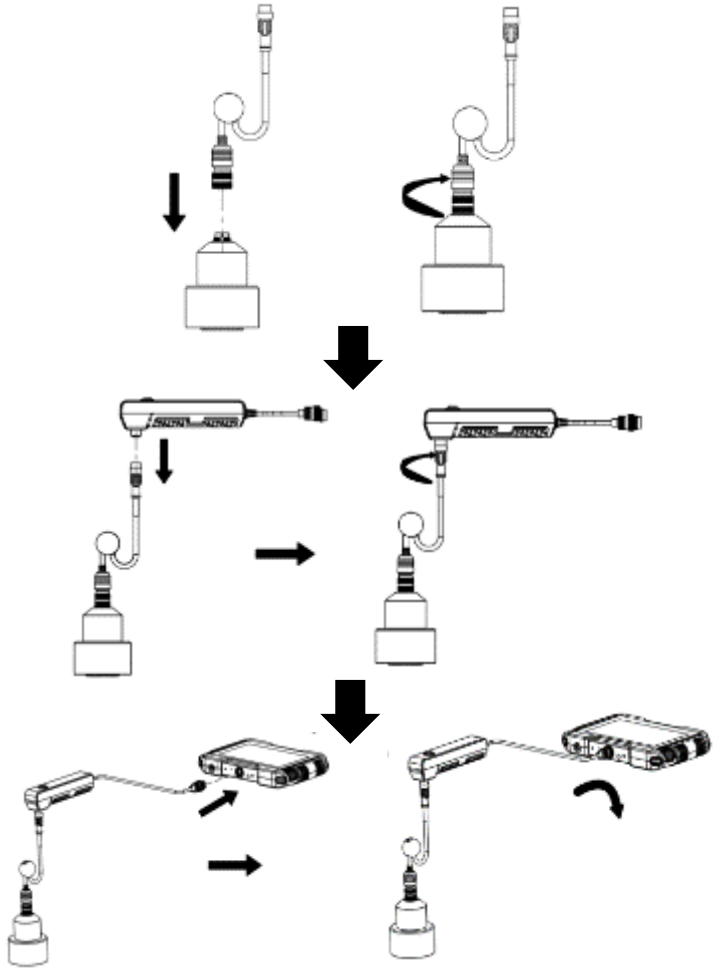
- Mount the Neck Strap



- Mount the Handheld Sensor



- Mount the Pick-up Sensor



AD21P – Scope Of Delivery

Device	Main Unit	1
	Handheld Sensor	1
	Pick-up Sensor	1
	Handle grip	1
	Headset	1
Batteries and Power	Power Supply for Battery Charger	1
	International Use Plugs (US/EU/UK/AU) for Power Supply (x4)	4
Cable	USB 2.0 A to USB Type-C Cable	1
Pouch		1
Manuals	Quick Start Guide	1
	Calibration Certificate	1

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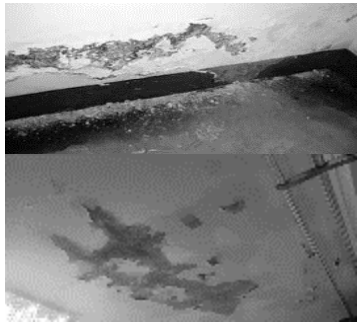
Indoor Leaks

- Leaks from pipes, plumbing fixtures and fittings are a significant source of water waste for many households.
- The 2016 Residential End Uses of Water Study found that the average household loses about **17 gallons** of water per day to indoor leaks.
- Some leaks are obvious, such as dripping faucets and leaking water heaters.
- Unfortunately, many leaks go undetected for years because the source of the leak is not visible.

Leak Under The Floor

Heating Pipes/
Underfloor Heating Pipe Leaks

Water Supply Pipe Leakage/
Water Pipe Leakage



Roofs And Walls,
Water Seepage In The Ground

Fire Sprinkler System

Why Do Indoor Leaks Occur?

Abnormally High Water Pressure

High water pressure can lead to leaking pipes.
Since your home's plumbing system can only handle a given level of water pressure, abnormally high pressure can lead to leaks at certain weak points, such as connection points, along the plumbing system. Weak parts of the pipes can even burst!

Corrosion

Most metallic plumbing parts are supplied with anti-corrosive treatments when new. These treatments normally wear off with time, leaving the metal susceptible to corrosion damage. Such parts may weaken, and develop holes or cracks that lead to hidden water leaks.

Negligent Repairs

You might end up with leaky pipes after performing negligent repairs around your home. For instance, you may puncture one of the water pipes in your home when conducting a home remodeling project or cause a leak when you forget to tighten a newly installed pipe of fitting along the plumbing system.

Regular Wear And Tear

If your home's plumbing system has been in use for a long time, you can expect it to develop leaks here and there as various parts start to wear out and lose their effectiveness. Connections may become loose and washers may lose their thickness and flexibility.

Common Types Of Water Leaks

Pipe leaks under sinks

Leaks behind drywall

Slab leaks
Foundational leaks

Toilet leaks
Water heater leaks

Traditional Leak Detection Methods

- Traditional pipeline leakage detection methods detect pipeline leakage by comparing the flow and pressure residual between the measurements and the values obtained by the mechanism model.
- **However, in the case of large noise and small leakage, this method may cause false negatives and false positives.**

Low Efficiency

Blind searching
time-consuming and laborious

Hard To Operate

Require high experience
Difficult to get started

Hard To Locate

The large excavation area, high cost
Poor leak detection and inaccurate positioning

How to Perform Leak Detection in 4 Steps

AD21P is to determine whether there is a leak in the pipeline, as well as the location of the leak.

Whether the pipes are newly installed or have been in use for some time, leaks can have a serious impact on the operation of buildings and the daily life of families. Leaks can lead to problems such as unstable water pressure, reduced water flow, and water hammer effects, which not only affect the quality of life, but may also cause damage to the building structure.

1

Initial Inspection

This includes looking at the pipe for visible cracks, sand holes, rust, etc., all of which could be the cause of the leak.

2

Pressure testing

After the initial inspection, the pipes need to be pressure tested. This can be achieved through the use of professional pressure equipment, by observing the pressure changes, you can detect whether the pipeline has a leak. Leak pressure Testing is the base point for any water pipe leak tester. Pressure loss is a vital symptom of a water leak.

3

Instrument detection

If the initial inspection and pressure test can not determine the location of the leak, then you need to use AD21P for detection. AD21P can detect the location of the leak through sound waves, electromagnetic and other ways.

4

Determine the location of the leak

According to the results of the instrument, you can determine the location of the leak and mark it.

AD21P –How to Making Step 3 Work Better

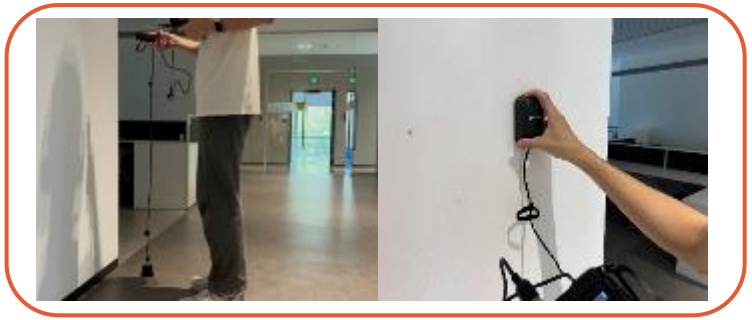
1 **Connect the equipment**
Connect the host, headphones and sensors, and ensure that the power supply is normal.

2 **Place the sensor**
Gradually place the sensor on the upper pavement of the pipeline, and the step length should be reasonably set according to the actual situation.

3 **Start the measurement and you can open the SuperDetect**
Turn on the switch and put on the headset. Begin to gradually approach the location of the leakage point, while paying attention to the feedback sound of the listening device.
With SuperDetect you can quickly help find suspected leaks even without using a headset.

4 **Compare the signal strength**
Judge the position of the leakage point according to the strength of the signal. The closer to the leak, the stronger the signal; the farther from the leak, the weaker the signal.

5 **Determine the location of the leak**
By constantly comparing the signal strength between different locations, you can ultimately determine the location of the leak.

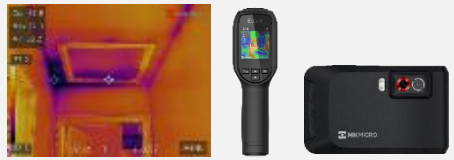


When a leak occurs in a pressure water pipe, the pressure water will rush out from the broken pipe and produce friction with the pipe wall. These acoustic vibrations and additional vibrations will spread above the pipe floor. The AD21P utilizes sensors to detect these vibration signals and convert them into audible sound.

How To Further Improve Detection Efficiency?

Thermal Imaging Camera

A thermal imaging camera is a very useful leak detector, but it is not the most accurate leak detection device. In short, an infrared camera does a good job of detecting the general area of a leak - it can tell you which pipe the problem is in, or where it needs to be focused.



Acoustic Leak Detector

Acoustic leak detectors are used to listen for the exact location of internal and external leaks, pinpointing the exact location of your leak without the need for excavation. That means you can go straight to the source of the problem.

Best Choice For Water Leak Detection

Combine vision and hearing to meet the most efficient detection method.

1 See images with thermal camera

Use thermal imaging cameras to search for suspected leak areas in a wide area.

2 listen to sounds with AD21P

Find the abnormal temperature area and accurately find the leak point.

THANK YOU

See the World in a New Way

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