SEWERIN
Technologies for leak detection.

Product Catalogue | Water Leak Detection

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About Us

The Sewerin group of companies is an internationally successful, technically innovative, family owned group with headquarters in Gütersloh, Germany.

With top-level products and services, we are the market technology leader and a partner to the gas and water supply industry. Together with our over 90 years of experience in the development of measuring devices, the knowledge accumulated by our own measuring teams contributes significantly to our success.

At the Gütersloh location, our innovative devices move through development, design, testing and production before they are finally ready for the market. Throughout, there is a particular emphasis on high quality and functionality. An important factor of success is the production in Germany.

For the water supply industry, we are offering electro-acoustic water leak detectors, noise loggers, correlators, tracer gas leak detectors and mobile measuring systems for flow analysis.

In addition to the sale of those measuring devices and services, we are offering stationary and mobile device maintenance service.

An extensive distribution network consisting of sales engineers, subsidiaries and distribution partners in over 80 countries makes success on a global level possible. In the US we cooperate with almost 20 official sales partners.

AQUAPHON® A 200 – Electro-acoustic water leak detection: professional – flexible – intelligent

Ideal for detecting leaks in water pipe networks

When it comes to detecting leaks in water pipes by electro-acoustic means, the hearing and experience of the user are paramount. Thanks to the outstanding quality of its microphone and measuring technology, intelligent analysis functions, and the practical, visual representation of results on the display, the ***AQUAPHON®*** system supports and simplifies this detection process.

The measurement principle

The water flowing out of the leak in the pipeline causes the pipeline material to vibrate. These vibrations are transmitted throughout the line and can be picked up as structure-borne noise, even at distant contact points such as fittings. The vibrations are also transmitted up through the ground to the surface as ground-borne noise, although this is very muted. The ***AQUAPHON®*** system is your perfect companion for leak detection as it makes the vibrations audible to the human ear and records and visually displays the volume and frequency spectrum.

Most reliable leak detection ever

This cutting-edge system offers comfortable, wireless handling, ease of use, versatility and a sturdy, ergonomic design. The ***AQUAPHON®*** system is ideal for both the prelocation and pinpointing of leaks for confident excavation. It is suitable for all your leak detection challenges and will help you locate leaks safely and reliably.

Intelligent system in practice

- The ***AQUAPHON®*** system is completely wireless as the ***TS 200*** carrying rod, ***AQUAPHON® A 200*** receiver and ***F6*** wireless headphones communicate by ***S***ewerin ***D***igital ***R***adio (***SDR***). Not only does this allow you incredible freedom of movement, it also offers a much greater sound quality without interference from swinging cables.
- The system is operated without buttons or switches using the sturdy 5.7 inch VGA display with touch screen. It offers excellent readability, even in strong sunshine, and can also be operated with gloves. The display is clear and features large, distinct symbols.
- The ***AQUAPHON® A 200*** receiver guides you through the various applications with instructions, which means that even less experienced and occasional users can operate the device reliably.
- Safety thanks to customisable hearing protection. The signal in the headphones can either be muted or completely switched off if there is any sudden loud interference noise, e.g. passing vehicles, or the microphone slips off the valve rod extension. Once the source of interference goes quiet, the hearing protection automatically switches back off again.

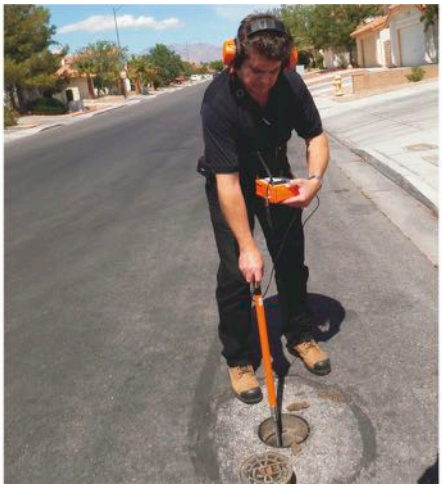
Components

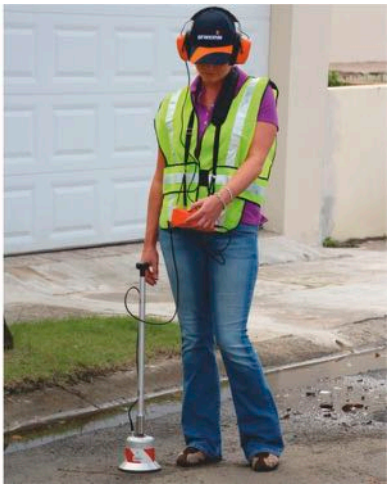
The system case provides ample space to safely hold all the components of the ***AQUAPHON®*** system. The ***TS 200*** carrying rod, the ***AQUAPHON® A 200*** receiver and the ***F6*** wireless headphones can be charged at the same time. Chargers are available for the vehicle as well as for the workshop and office.

AQUAPHON® A 100 – Standard and professional kits

Electro-acoustic Water Leak Detection

When a pressurized water pipe develops a leak, the water flows out into the surrounding soil at high speed. Structure-borne noise is then created by the vibration of the pipe as the high pressure water exits the leaking pipe. This vibration or noise can often be heard at contact points along the pipe such as valves, hydrants and service lines with amplification provided by the ***AQUAPHON® A 100***.





Surveying with a test rod

Metal pipe materials transmit structure-borne sound over particularly long distances. The test rod is ideal for helping to determine if a leak does, in fact, exist in the pipeline systems.

Location pinpointing with ground microphone

Non-metal pipe materials are less effective at transmitting structure-borne sound than metal ones. Simply checking the pipeline fittings with the test rod does not usually produce satisfactory results. The length of piping between the fittings also has to be examined with the ground microphone. Using the ground microphone at regular intervals enables the leak to be located with sufficient accuracy for confident excavation. The ***AQUAPHON® A 100*** displays an accurate visual comparison of the noise intensities.

Features of the ***AQUAPHON® A 100***

- Automatic microphone recognition – appropriate frequency settings automatically selected
- Digital signal processor – for significant reduction of hissing
- Hearing-protection function – operator's hearing no longer in danger
- Filter-optimisation function – makes even difficult to distinguish sounds easier to hear
- Minimum noise level function – displays the lowest level of noise. More useful than the loudest!

AQUAPHON® A 50 – Compact – on-hand – efficient

The reasonable entry-level model for professional accoustic water leak detection

The ***AQUAPHON® A 50*** system provides professional, electro-acoustic water leak detection. The ***A 50*** receiver and various microphones make the prelocation and pinpointing of leaks successful. When both microphone and headphones are attached the device boasts impressively high reproduction quality. The display helps by visualizing the noises to provide reliable, differentiated evaluations. When the ***A 50*** with ***SDR*** radio module (**S**ewerin **D**igital **R**adio) is used and the ***F8*** wireless headphones are connected, there are no cables to affect the sound quality or restrict your movement.

Efficient prelocating and pinpointing of leaks

Superior microphone technology ensures excellent sound quality with the ***UM 50*** universal microphone and the ***TS 50*** test rod. The ***A 50*** receiver is ideal for prelocating at fittings and pinpointing on a variety of surfaces – indoors and outdoors. An activation key conveniently starts and stops measurements. The supporting display indicates current and previous minimal levels, both numerically and graphically. It boasts a particularly practical feature: the display is always easy to read thanks to an optimized tilt angle that automatically rotates its view by 180° depending on the carrying position. Volume, filter limits and hearing protection can all be customized for optimal performance

Advantages of the ***AQUAPHON® A 50***

- Long availability – fully charged – ready to use for a work week
- Compact, lightweight, handy housing with belt clip
- Adjustable filters: frequency ranges can be individually adjusted
- Illuminated, tilt angle and rotating display (180° rotation)
- Wired or wireless versions available: with or without ***SDR***
- Added supporting visualization of minimal noises on the display
- Additional microphones and adapters available
- Compatible with existing microphones (***BO-4***, ***3P-4***, ...)

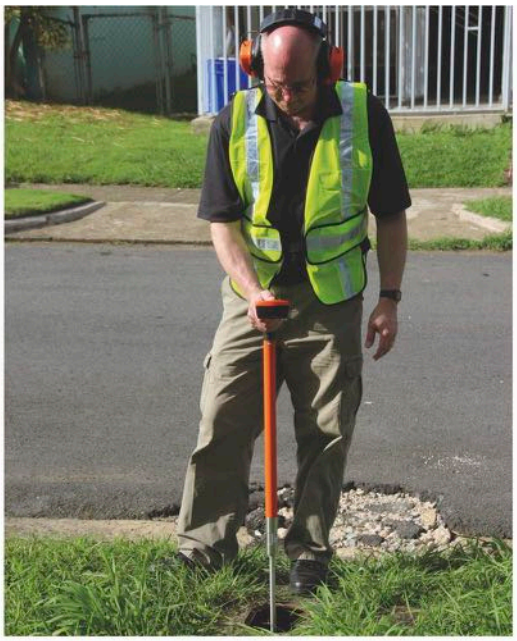
Maximum carrying convenience, long availability

Practical dimensions and low weight make the compact ***A 50*** receiver perfect for everyday use. As an alternative to the carrying strap, the lightweight receiver can be easily fastened to your belt with a clip: freedom of movement, effortless carrying, no annoying elements! The powerful battery guarantees optimal availability without recharging – for up to one work week.

AquaTest T10 – Robust test rod for electro-acoustic water leak detection

Pre-locating

The ***AquaTest T10*** is a test rod with innovative technology and ergonomic design. It acts as a surveying tool for leaks in water pipe networks and allows the user to identify where additional efforts should be concentrated. The ***AquaTest T10*** is the first test rod made by SEWERIN for which no additional receiver is required. The headphones are activated by merely touching the special sensor area on the keypad. The noises that are picked up are visualized on a display incorporated into the handle. In the ***SDR*** radio module configuration (***S***ewerin ***D***igital ***R***adio), the test rod can be used with radio headphones. This means no more cables to get in the way.



Principal application

The high-quality microphone technology of the ***AquaTest T10*** permits first-class sensitivity in picking up noises. Even the smallest leaks are reliably detected by the test rod. When using the test rod on objects that lie deeper under the surface, extensions can easily be screwed on between the probe tip and microphone. Individual optimization of acoustic results is assisted by the option of selecting one of eight different filter settings. When operating the unit, noise can be sampled by simply placing your thumb on the sensor area. The unit listens only as needed, thereby reducing the annoyance and distraction of unwanted sounds. The ***AquaTest T10*** display shows the current and previous minimum noise levels, as well as the current noise intensity. The minimum noise levels are shown as numeric values; the actual noise intensity is displayed as a bar graph. This gives even less experienced operators visual support if and when they are approaching a leak.

Features

- Innovative combination of electronic amplifier and test rod without interfering cables
- Ergonomic design ensures non-tiring operation
- Robust construction for use outdoors
- Built-in rechargeable batteries
- Outstanding noise quality, using high-performance microphone technology
- Visual display helps the operator determine the noise level
- No irritating operating noises in the headphones, thanks to the keypad touch sensor area
- Individual adjustment of the filter bands and volume / hearing protection setting for optimum noise recognition
- Two product configurations are available – with or without wireless technology

Additional applications – pinpointing leaks and acoustic pipe location

Previously surveyed leaks can also be pinpointed with the ***AquaTest T10***. For this, the probe tip is replaced with a tripod. This picks up the noise of the leak at the surface. If a pipe is set into vibration, e.g. using the knocker or stopper of the ***COMBIPHON***® system, the position of the pipe can be located using the ***AquaTest T10***. This involves systematically testing the surface in short intervals. The volume increases in approach to the vibrating pipeline. The noise is loudest directly above the pipe.

Stethophon® 04 wireless –
Compact listening device for detecting water leaks

Characteristics

The ***Stethophon® 04*** is a sound detector for recording and amplifying structure-borne oscillations of all kinds. The oscillation sensor provides undistorted sound reproduction even when the noise is barely audible.

Besides the cable headphones, a wireless version is available including ***SDR*** digital radio. The ***S***ewerin ***D***igital ***R***adio (***SDR***) offers a sound transmission quality equal to or better than cable. By going without the cable, the comfort of work is improved considerably. Headphones and detector connect automatically by bidirectional radio link when switched on.

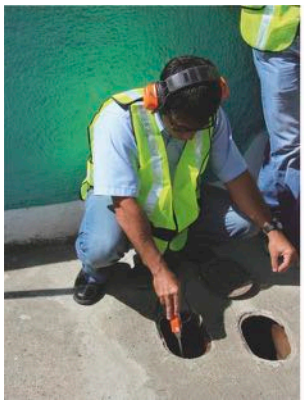
Sewerin Digital Radio works over short distances without any loss. Unlike simple analogue radio transmissions, the completely digital signal processing does not allow acoustic interferences, caused by hissing, re-amplifying, etc., to occur.

The filter function enables the users to listen to the sound at the frequency that best suits their hearing and the particular noise being listened to. The filters make it easier to hear certain noises such as the deep-pitched sounds typical from leaks in plastic pipes and higher frequencies from metallic pipes.

The hearing protection feature automatically ensures that the headphones are muted when loud noises suddenly arise to protect the operator.

To help with the leak detection, the ***Stethophon® 04*** not only indicates the noise levels acoustically, but also displays them digitally.

The lowest measured noises of the previous and current locations are numerically displayed and can be compared objectively.



Applications

- Slab leak detection
- To be used as a fast leak detector in water networks
- Examination of house service lines when the water meter is replaced
- Examination and localization of damages in compressed air systems
- Check on machine bearings

Features

- Wireless headphones using digital signal transmission (***SDR***)
- External ground microphone
- 8 filter levels
- Hearing protection function
- Numerical display of minimum noise level (0 – 1000)
- Min. operating time 8 hours
- Lightweight packaging in a robust Pelican™ case

COMBIPHON® – The non-metallic pipe locator

Locating plastic pipes acoustically with a pulse generator

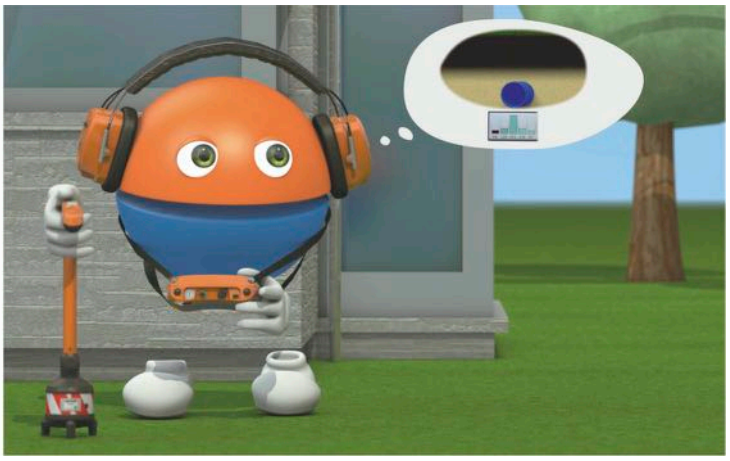
As non-metallic pipes are not electrically conductive, they cannot be located with the classic electro-magnetic method. Another principle in pipe location is used with the acoustic method: the pipes transmit mechanical vibrations better than the surrounding soil.

The vibrations are transmitted along the pipe and over the soil to the surface where they can be detected by ground microphones (***AquaTest T10, AQUAPHON® A 50, A 100, A 200***).

Just as with the acoustic location of water leaks, the highest intensity indicates the position of the pipe. Basically fiber cement or metallic pipes can also be located with this method.

The principle

The volume increases as you get closer to the vibrating pipeline. The signal is loudest directly above the pipe, thereafter the intensity starts to decrease again. The visual display is particular helpful for novices or those who do not use the system often.



COMBIPHON® - Striker

Water service lines are caused to vibrate using the Striker. This steadily taps the pipe from the outside like an electric hammer.

The Striker can be easily attached to pipes with a diameter of up to 4 inches using the supplied chain attachment.

COMBIPHON® - Stopper

Water mains require more energy to vibrate. The water culumn is set in motion by controlling the volume using the Stopper at a fire hydrant. The Stopper is a battery powered intensity controlled piston. The sound can be detected over long disctances, depending on the soil conditions (clay, compact soil – over 1 Mile).

An advantage in using a power controlled piston, as opposed to a spring one, is that pressure variations have no effect on the settings.

VARIOTEC® 460 Tracergas – The specialist for leak detection with tracer gas and hydrogen

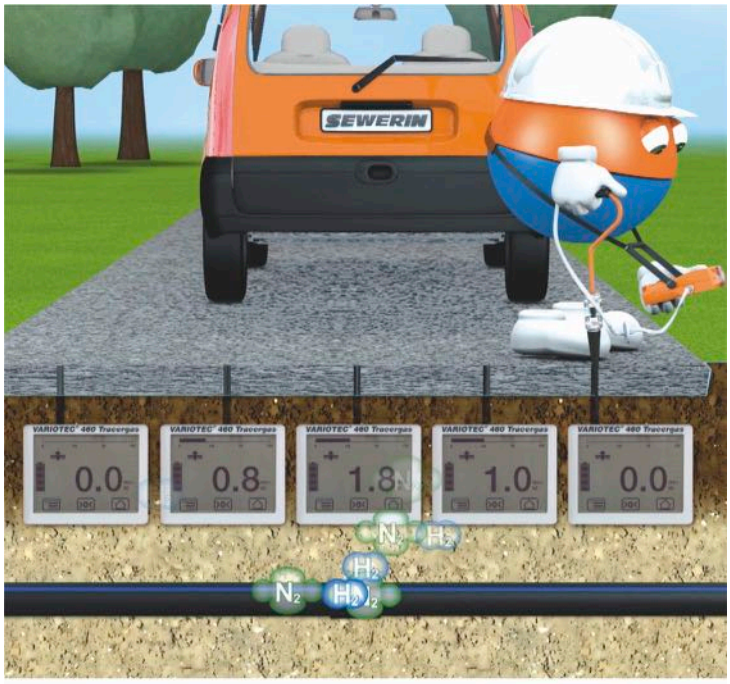
A tried and tested method

Using tracer gas is a tried and tested method of pinpointing leaks. It can be used in gas and water distribution networks, pipelines in buildings, heating systems, pressurized communication cables, gas-filled high voltage power lines and landfill sites sealed with double membrane layers. It can also be used to test for leaks in industrial products such as pipes, pumps, engine blocks and airfoils.

Detecting water leaks by tracer gas involves feeding a mixture of 95% nitrogen (carrier gas) and 5% hydrogen into the pipelines. The hydrogen escapes through the leak and is detected by the highly sensitive, specialized sensor.

The low amount of hydrogen (just 5%) means that this method is safe: the gas is incombustible as per ISO 10156 thanks to the use of nitrogen as the carrier gas. It is non-toxic, and therefore also permitted for use in drinking water networks, as well as non-corrosive.

Tracer gas is cheap and easy to obtain from technical gas or welding gas dealers. It is also environmentally-neutral and permeates all cover layers such as asphalt, concrete and other seal coats. Tracer gas always looks for the shortest route from the leak to the surface.



Rely on precision and safety

The ***VARIOTEC® 460 Tracergas*** was developed especially for leak detection on underground pipes by using tracer gas. It is characterised by an outstanding price to performance ratio.

Precise: The extraordinarily low cross sensitivity of the gas-sensitive semiconductor (SC) ensures an absolutely sure result and a resolution down to 0.1 ppm hydrogen.

Functional: Thanks to an innovative operating concept, a large display and simple menu structure, device operators can quickly get reliable results.

Efficient: In combination with the bell probe D80 you can achieve outstanding reaction times.

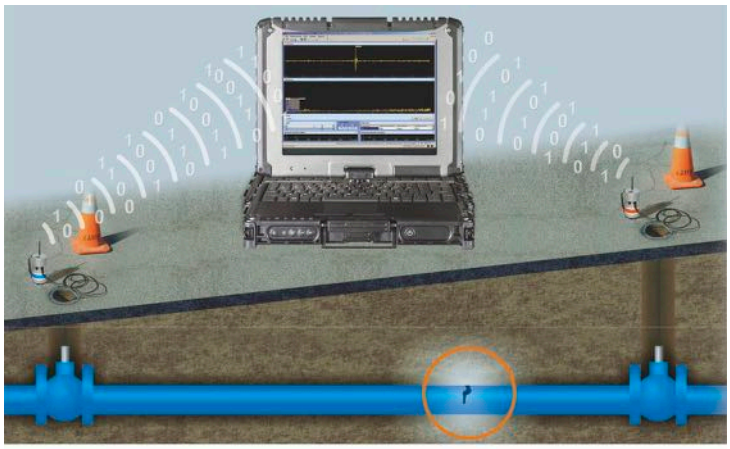
Flexible: The expanded measuring range of the thermal-conductivity sensor, up to 100 % vol. hydrogen easily allows for further measuring tasks.

Mobile: The 4 AA-size rechargeable batteries can be charged in just 3 hours and the operating time is at least 8 hours. As an alternative, you can use disposable batteries.

SeCorr® 300 – High precision all material correletor

The principle

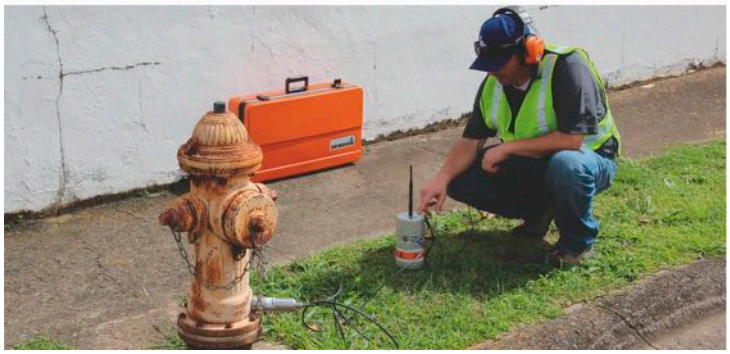
The ***SeCorr® 300*** is a system of unprecedented quality to complement the existing product range. The fully digital signal processing and transmission by and large eliminates the interference which so often causes problems in conventional correlators.



Digital correlation

The digital radio eradicates the notorious hissing in transmission paths. Even the narrow bandwidth of analog modules no longer poses a restriction. The noises recorded from the leak are already digitized in the microphone thus eliminating feedback via the cables.

This produces significant advantages, particularly in plastic pipes, where the noise emitted from the leak is, as a rule, very poorly transmitted and thus very quiet. The result is improved leak coverage in non-metallic pipes, which is increasingly used nowadays in water pipe networks.



The hardware

Notebooks and desktop PCs can be used to analyze the measurements, as can Tablet PCs or field notebooks, for example, which have been specially designed for use in adverse conditions. Thanks to the USB standard, the system can be easily connected to the computers. Provided the computer is state-of-the-art, the ***SeCorr® 300*** system offers the user every possibility to produce optimal results, even under difficult conditions where conventional correlators would reach their limits.

Overview of basic functions

- Offline correlation – for long distance correlation outside the radio transmission range
- Different user modes – simple – standard – detailed
- Automatic sound velocity calculation
- Original noises can be recorded; there is the option of creating a noise archive for comparison purposes
- Automatic filtering (FFT) and interference suppression
- Filters of up to 10 types in up to 5 filter groups; the results of various, arbitrary filter settings can be compared
- Input up to 5 different pipe sections and up to 3 freely definable extra materials; optimal flexibility as opposed to fixed standards for correlation professionals
- Easy drawing of damage sketches to supplement measurement reports; optimal documentation for service companies
- Digital hydrophones set for long distance and/or large diameter pipes including fire hydrant quick adapters

SeCorr® 08 – Small – easy usage – precise

The handheld correlator

Electro-acoustic methods of leak detection can be affected by external noise interferences such as cars, wind etc. The correlator ***SeCorr® 08*** is unaffected by these interferences making leak detection possible in even the noisiest environments. Other surrounding influences including the depth of pipe, ground conditions and rain have no effect on the accuracy of results.

The operator's experience and sense of hearing are paramount when utilizing electro-acoustic devices; Correlation is based on purely mathematical calculations. Consequently the reliance on these subjective views is eliminated allowing anyone with minimal training to carry out leak location.

Why correlation?

Unlike electro-acoustic leak detection in water pipes, correlators work independently of the volume of the leak noises. This means that the intensity of the ambient noise barely affects the measuring procedure.

Successful correlation is therefore even possible during the day on busy roads when electro-acoustic measurement is not an option.

Factors such as laying depth, surface, type of ground or ambient interference, for example wind or rain, do not affect the accuracy of the measuring result.

Hearing and experience of the user do not determine the success of the leak detection operation. The technical possibilities of the user-friendly correlator alone determine the quality of the measuring result.

Features of the *SeCorr® 08*

- Latest DSP-technique (Digital-Signal-Processor)
- High-resolution pixel display
- Water-resistant film-keyboard and increment dial for comfortable operation
- Coherence analysis for optimal filter settings
- Automatic frequency analysis
- Highest calculating accuracy and very high speed of measurements
- Radio reception for more than 1.24 miles transmission on each channel
- High flexibility in combination of all components
- Radio-signal monitoring

Hydrophones

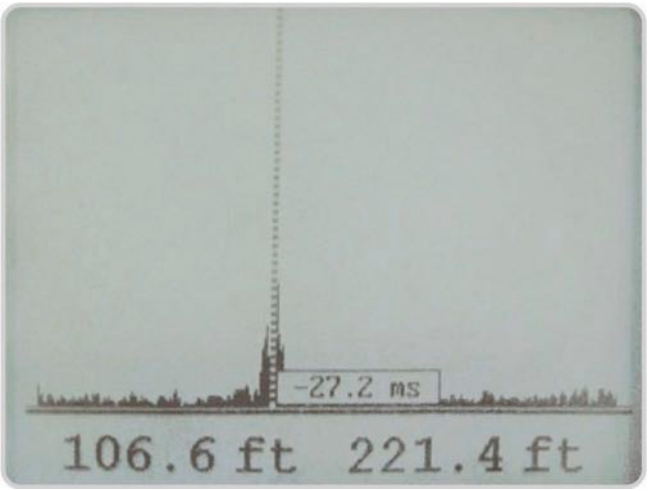
The hydrophone does not record sound from the pipe material, but instead directly from the water column. This considerably improves the leak coverage, especially when correlating plastic piping. It also makes it possible to successfully detect leaks over hundreds of meters.

SeCorrPhon AC 06 – Fully functional correlator and leak detector

The two in one system

Two processes – each process has its limits and weaknesses. Cleverly combining all the advantages maximizes the certainty of determining the exact location of the leak.

SEWERIN's ***SeCorrPhon AC 06*** makes use of both methods at the same time.

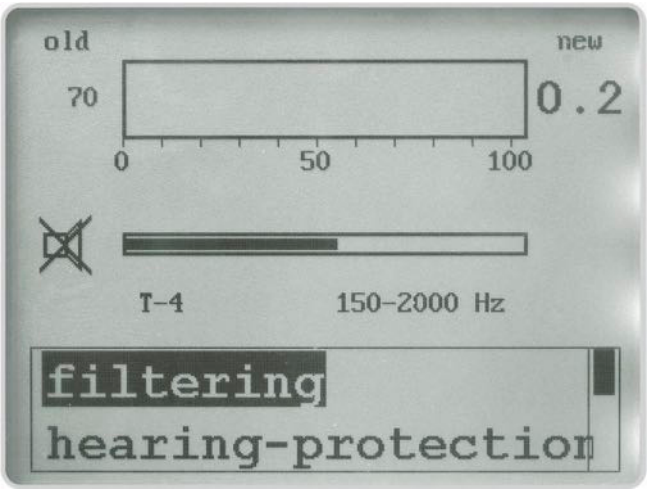


What is correlation?

Correlation is computer-assisted leak detection in underground pressure line systems. Leak sites emit a noise which is carried along the pipe material. This noise reaches two fittings (valves, hydrants, home shut-off valves etc.) at different times. The time lag depends on the distance of the leak from the two contact points.

Highly sensitive microphones record the incoming noises on the fittings and a radio transmitter transmits these noises to the receiver where the run time difference of the signals is determined.

The exact position of the leak is then calculated from the information about the material, the diameter and the length of the measuring section.



What is electro-acoustic water leak detection?

Firstly, the test rod is used to listen to suspected leak noises on accessible fittings (hydrants, main and shut of valves, etc.). This preliminary step isolates the area to be examined more closely. The ground microphone is then used to listen to the surface of the section of pipe and determine the exact location of the leak. The human ear still plays an important part in analyzing the noise as it can compare and analyze the volume and sound.

SeCorrPhon as an electro-acoustic water leak detector

- Excellent sound thanks to powerful digital signal processor
- Listening with on-screen support: minimum sound level display, memory function
- Hearing-protection function
- Variable filter setting
- Automatic microphone recognition (ground microphones, test rod or small, light microphone for applications inside buildings)
- Hydrophones set for long distance and/or large diameter pipes including fire hydrant quick adapters

SePem® 150 – Radio noise loggers

The principle of stationary noise logging

The duration of time that water leaks from the distribution network has a significant influence on “real water loss” and “non-revenue water” calculations. The goal is to quickly identify water leaks to reduce the dollars lost, reduce the impact on non-revenue water calculations, be efficient, be good stewards of the environment, and reduce potential property damage. This goal can be achieved with ***SePem® 150*** loggers.

In addition to conventional leak detection survey methods, ***SePem® 150*** loggers are an effective, permanent monitoring tool to quickly identify leaks that may never reach the surface. With its ease of reprogramming and versatility, the ***SePem® 150*** loggers can also be redeployed to other locations for shorter-term leak detection surveys. This process is often referred to as “lift and shift”.

With the aid of the ***SePem® 01 Master***, the user establishes listening times, frequency and duration, alarm levels and “Patrol Times” for the collection of data. The “listening times” are typically programmed for periods during which flow and traffic noise are at their minimum level. “Patrol Times” are typically set for “regular working hours” eliminating the need for overtime.

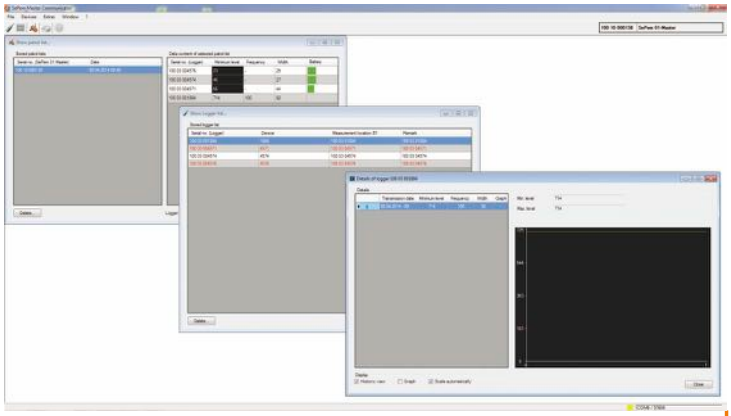
The compact design of the ***SePem® 150*** enables the logger to be placed in valve boxes, meter pits, and on unusual contact points. The highly sensitive microphone enables programmed monitoring of distances up to 1,600 linear feet of pipe between loggers. Spacing of the logger is dependent on the pipe size, pipe material, service density, and contact points available.

The ***SePem® 01 Master*** is portable and can be carried, or placed in the vehicle mounting bracket, while patrolling for data collection.

During patrol, the result is both an audible and visual “leak/no leak” indicator, substantiated by two pieces of critical leak detection data- “minimum noise level” and “noise consistency”. Data results are cataloged by physical location, logger, patrol, date, and can be easily archived for comparison with future data. One ***SePem® 01 Master*** can accommodate up to 500 ***SePem® 150*** loggers.

SePem® Master Communicator for data backup and visualisation

The ***SePem® Master*** Communicator software is freeware, which allows you to display the data managed on the ***SePem® 01 Master*** directly on a PC. The patrol lists are transmitted directly after connection and saved in a database. In logger lists you can directly access and easily manage measurements from the individual ***SePem®*** noise loggers.



SePem® 01 GSM – Loggers with cell phone technology

Monitor your water network 24/7 from the office

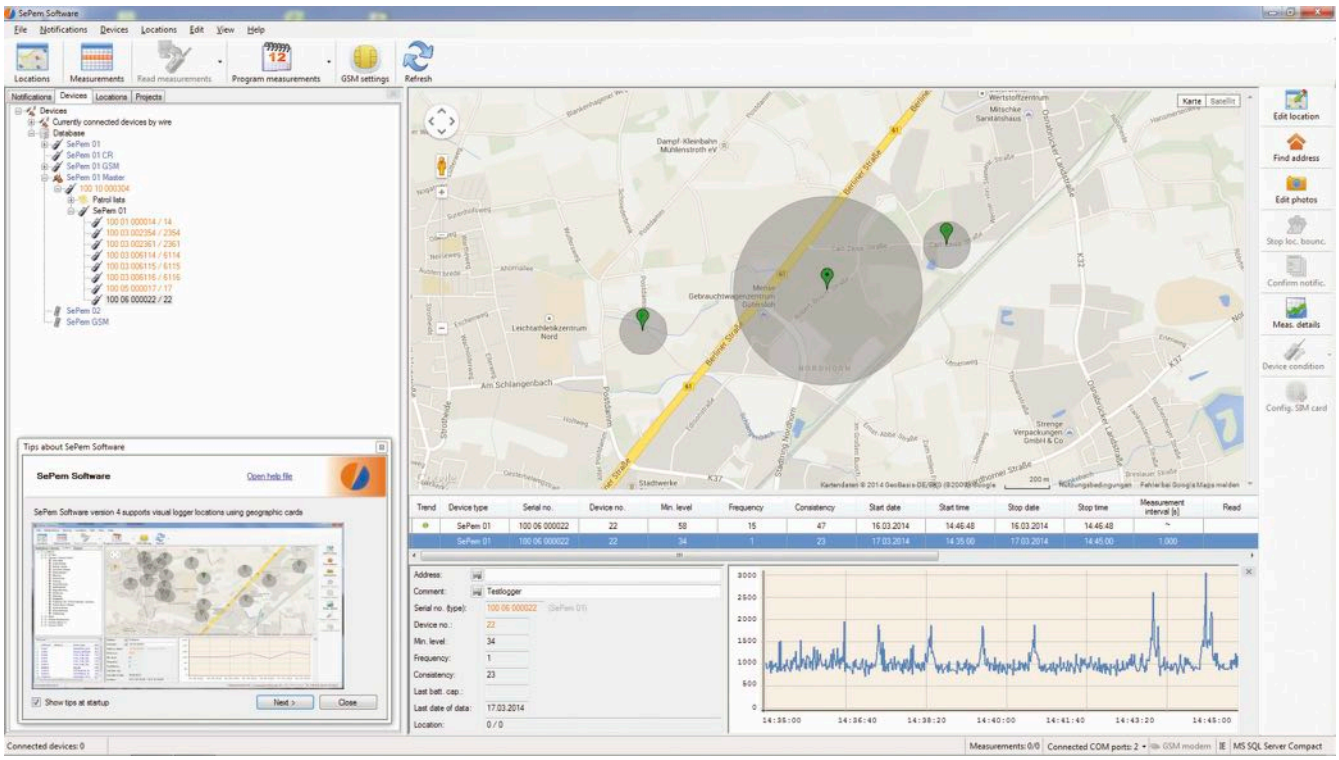
Highly sensitive noise logger for stationary monitoring of water networks including a ***GSM*** module for data transmission. The compact design of the ***SePem® 01 GSM*** is especially suitable for fire hydrant valves and line valves. Because of the small height of the logger, when horizontally installed, the ***SePem® 01 GSM*** can also be placed inside meter pits. The logger records the noises during a user-defined measuring period and analyzes the data. The results are then sent directly via Short Message Service (SMS) through an email gateway, downloaded to a computer and viewed using the ***SePem®*** software with Google Maps application.
One push of a button is sufficient – driving along the measuring points is not required.

The advantages

- Leaks are recognized very early – saving money by reducing duration of leak times
- No additional time required for driving past measuring points, saving fuel, salaries and productivity
- Flexible programming of measurement and data transmission – optimal configuration according to local and network conditions. The information is delivered directly to you, on your terms.
- Very low maintenance
- Less amount of loggers needed - as required for correlating loggers !

The software

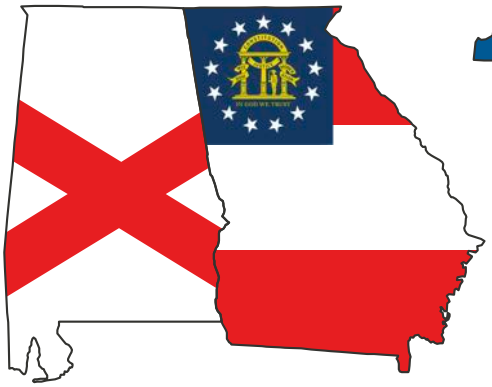
The ***SePem®*** software can be used to manage both the ***SePem® 01 GSM*** loggers as well as the established ***SePem® 02*** models. It offers the user extensive functions for carrying out diverse measuring tasks professionally. All the main functions are easily accessible.



Tracer Electronics LLC

Jason Myers
(615) 613-6645
(KY / TN)

Tom Story
(615) 517-5423
(AL / GA)



Patrick O'Harold
(864) 993-1208
(NC / SC)

Robby O'Harold
(864) 993-0527
(FL)

Ken Smith
(615) 285-3952 ext. 101

William Spriggs
(615) 285-3952 ext. 102
Repairs & Calibrations

Michele Smith
(615) 285-3952 ext. 103
Order Processing

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sewerin-usa@sewerin.net
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