



SePem® 02



SePem® 02
Detecting water leaks systematically
by using the most flexible logger available

The principle and fields of application

Using electro-acoustic methods to detect water leaks very much depends on the intensity of all noises surrounding the operator. Therefore during daytime it is often impossible to work that way and the survey of water networks is done in the night.

Non-permanent logging is an effective and economic alternative to night work. These loggers measure the intensity of noises during a defined period of time in the night. In case there is no leak in an audible distance to the **SePem® 02** the lowest noise level measured will be almost zero. Due to the fact that leaks do not appear or disappear at a certain time of measuring (like for example consumption does) the recorded values are significantly higher than zero.

Applying **SePem® 02** for this kind of network monitoring a suitable set of loggers (depending on the length of the network to be inspected) is first of all programmed to measure in a certain schedule (e. g. a 4 week cycle). Afterwards the units are taken out into the field and simply moved daily to measure in different places every night. Reading them every day is not required due to the large memory of each **SePem® 02** logger, but is possible at will. When the defined cycle is done, all units are connected to a PC and the results are downloaded for evaluation. Far more information than just "leak" or "no leak" is given in order to avoid any waste of time in following up the results.

The modular and most flexible **SePem® 02** additionally can be used for other measuring applications as well, such as pressure logging or even stationary data recording. The wide range of system components allows connection of the loggers to almost every possible point of contact to the pipe under inspection.



Mounting the logger at any point of contact to the pipe underground is possible (e. g. hydrants or valves). Coupling by magnet or adapter ring.



Using any adapter to M10 thread the logger can even be attached to points above ground.



With the GMS module linked, the logger can be applied for stationary purposes (e. g. long term pressure measurement or stationary noise monitoring).



For pressure measurement the **SePem® 02** can be coupled to DIN underground fire hydrants. Connection to other fittings is possible with adapters to 1" or 3/4" BPS threads.

System components



Every **SePem**® device offers a very flexible power supply. Alkaline batteries or accumulators can be applied.



Many different microphones can be chosen to be connected to the **SePem**® device. This modularity enables the operator to fulfill different jobs utilising the same logger.



Communication between all loggers and the PC is effected using different types of interfaces. Boxes **1** are very suitable to be chosen in case a multiple of 6 loggers is used, because they can be integrated into a measuring vehicle or piled up in the office. Cases **2** offer the possibility to store accessories as well, to have them at hand when needed. In case accumulators are used with the **SePem**® devices, these communication adapters are required for charging. Carrying cases **3** can pick up 12 loggers and basic accessories.



SePem® SCAN allows the reading of loggers without a PC. Two buttons enable even less experienced users to get results immediately.



SePem® GSM can be linked to any basic **SePem**® device. After measurement the results are converted into an email and send to any defined account. The operator can download this information by pressing one button of the software on demand.

Sensors and accessories



Noise sensors can be attached to the points of contact by a magnet **1** or fit into a DIN hydrant **2**.



Hydrophones are available for leak detection especially on plastic pipes (PP) or trunk mains of large diameter (LD). Each of them can be chosen to fit any 1" BPS thread **1** or DIN fire hydrant **2**.



Pressure sensors are available for DIN hydrants **1** or any 1" BPS thread **2** as well as an air outlet adapter **3** allows the sensors to be used for peak monitoring.



By using these tools, pressure sensors or hydrophones are attached to DIN underground fire hydrants.



A variety of Storz fittings **1** is available to couple the **SePem® 02** to above ground hydrants. A protective pipe **2** and a lock can be chosen to prevent theft.



A collection of different chains can be used to lower the logger down into valve chambers.



In order to achieve an optimal GSM transmission, various antennae are at choice.



The software

Data base features



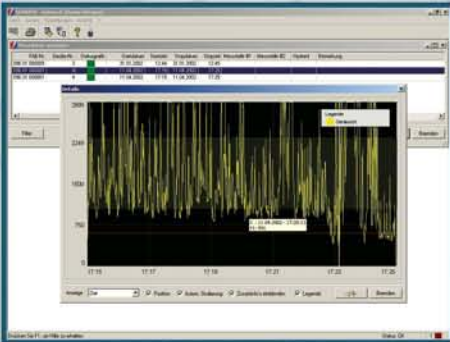
The communication and evaluation software offers extensive functions. Not only the control and check-up of the single measurements, but also a comfortable administration of measuring points the generation of lists to classify the logger to the corresponding measuring points.

Read-out of results



- Automatic recognition of the connected logger
- Tabular presentation of the recorded data
- The tabular presentation can be edited according to the operator's requirements
- Permanent monitoring of communication parameters ensures an optimum safety during read-out
- Editing of values in internal data bases
- Filter function

Evaluation



- Stored noise samples of the minimum levels can be heard via sound card of the PC
- Diverse graphics for noise analysis:
 - Histogram
 - Frequency spectrum (FFT)
 - Level, chronological course
 - Level, intensity course

Diagnosis



- Each **SePem**® can be tested without additional software.
- The diagnosis includes besides instrument-internal information also status statements on LED's and accumulators.

Technical Data

SePem®

- Housing of non corrosive steel, protection with sensor attached according to IP68 (submersible down to 1 m)
- Large memory capacity of 1 Mb
- Measuring interval: selectable from 1ms up to 60s depending on the sensor attached
- Power supply: 4 batteries (rechargeable or disposable) of AA size (LR6)
- Life time: up to 5 years (with Lithium batteries)
- Weight: 980 g
- Dimensions: height 110 mm, diameter 55 mm
- Operating temperature: -20 °C ... +50 °C (depending on power supply chosen)
- Storage temperature: -20 °C ... +70 °C (without batteries)

Sensors

Common characteristics:

- Housing of non corrosive steel, protection with logger attached according to IP68 (submersible down to 1 m)

Microphones:

- Measuring interval: selectable from 0,1 s ... 60 s
- Maximum pressure hydrophones: 25 bar
- 1" BPS standard thread for hydrophones

Pressure sensors:

- Measuring interval: selectable from 1 ms ... 60 s
- Pressure range 0 ... 20 bar
- Accuracy +/- 0.5 % of the measured value (at +20 °C)
- Maximum overpressure: 30 bar
- 1" BPS standard thread for connection to the pipe under test

SePem® GSM

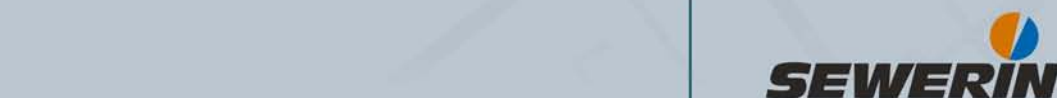
- Housing of non corrosive steel, protection according to IP68 (submersible down to 1m)
- Power supply: 4 disposable batteries of AA size (LR6)
- Life time: up to 5 years (with Lithium batteries)
- Weight: 850 g
- Dimensions: height 130 mm, diameter 55 mm
- Operating temperature: -20 °C ... +50 °C (depending on power supply chosen)
- Storage temperature: -20 °C ... +70 °C (without batteries)

Cases

- Communication cases or boxes for charging 6 loggers **SePem® 02** (to be connected to 100 - 220 V AC or 12 V DC)
- Transport case for up to 12 loggers
- All cases made from rug-proof ABS, reinforced with Aluminium frames

Accessories

- Various chains to lower the loggers down into pits
- Adapter for pressure sensor to ¾" BPS thread
- Communication cables for data download in the office or the measuring vehicle
- Set of wearing parts to seal the joints between logger, sensor and battery compartment



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