

# ENIGMA 3 STANDARD DATA LOGGERS



## What's Included

## KEY COMPONENTS

- 1 Three Data loggers w/ magnet base
- 2 Data transfer USB cable
- 3 Eight position data transfer case
- 4 Enigma Classic PC Software
- 5 Enigma Web Portal

## DESCRIPTION

Enigma is a 3-logger correlation system used to locate leaks in underground water pipes. Sensors on the loggers detect vibrations caused by leaks, converting them into sound. By using multiple sensors and comparing the times and distances of these sounds, the system can accurately pinpoint the leak's location. Enigma 3 can provide up to 3 correlations with a single deployment.

## MULTI-POINT NETWORK CORRELATION

After retrieval, the recorded leak sound data is transferred to the host software for correlation analysis. The software processes the acoustic data from each logger pair to calculate and display leak locations between all deployed loggers. Pipe sections, logger positions, and calculated leak locations are displayed graphically to provide a visual representation of the survey area and correlation results.

## SEPARATING GENUINE WATER USAGE

Each logger records during three sample periods, typically spaced one hour apart. A characteristic of leak noise is that it is always constant and so if the correlation peak is not present during all three samples then it is due to water use and not leakage.

## OPTIMUM LEAK SENSING

Overnight use provides ideal conditions for leak detection. This is because background acoustic noise from traffic, water usage and other sources, is lowest and, at the same time, water system pressure can be higher which greatly aids leak sound propagation.

Three data loggers with an 8-position data transfer case, allowing for future expansion.



## SPECIFICATIONS

### CORRELATION DATA LOGGER

#### Sensor (data logger)

Type	Integral Accelerometer
Frequency range	1 - 2,400 Hz
Sensitivity	10 V/g
Attachment	Integral magnet

#### Sampling

Rate	4860 Hz
Resolution	24-bit
Number of epochs	1, 2, or 3
Epoch duration	60 seconds
Max total recording time	180 seconds

#### Power

Type	Dual lithium cells
Replaceable	At factory or service center
Operating life	>5 years

#### Physical

Dimensions	104mm (high) x 59mm (diameter)
Material	Aluminum
Waterproof rating	Submersible to IP68
Operating temperature	-10°C to +60°C

### COMMUNICATIONS CASE

#### Host Communications

Type	USB
Rate	2.5 Mbits/sec
Data saved into case	One run (8 correlations)

#### Memory

Data Store	32MB static Ram
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#### Communications

Type	Optical
Rate	2.5 Mbits/sec

#### Power Supply

Type	User replaceable alkaline 4 cell pack
Physical	
Dimensions	Holds 8 loggers 410 x 325 x 172 mm
Material	Rugged high impact plastic
Waterproof rating	IP65
Operating temperature	-10°C to +60°C

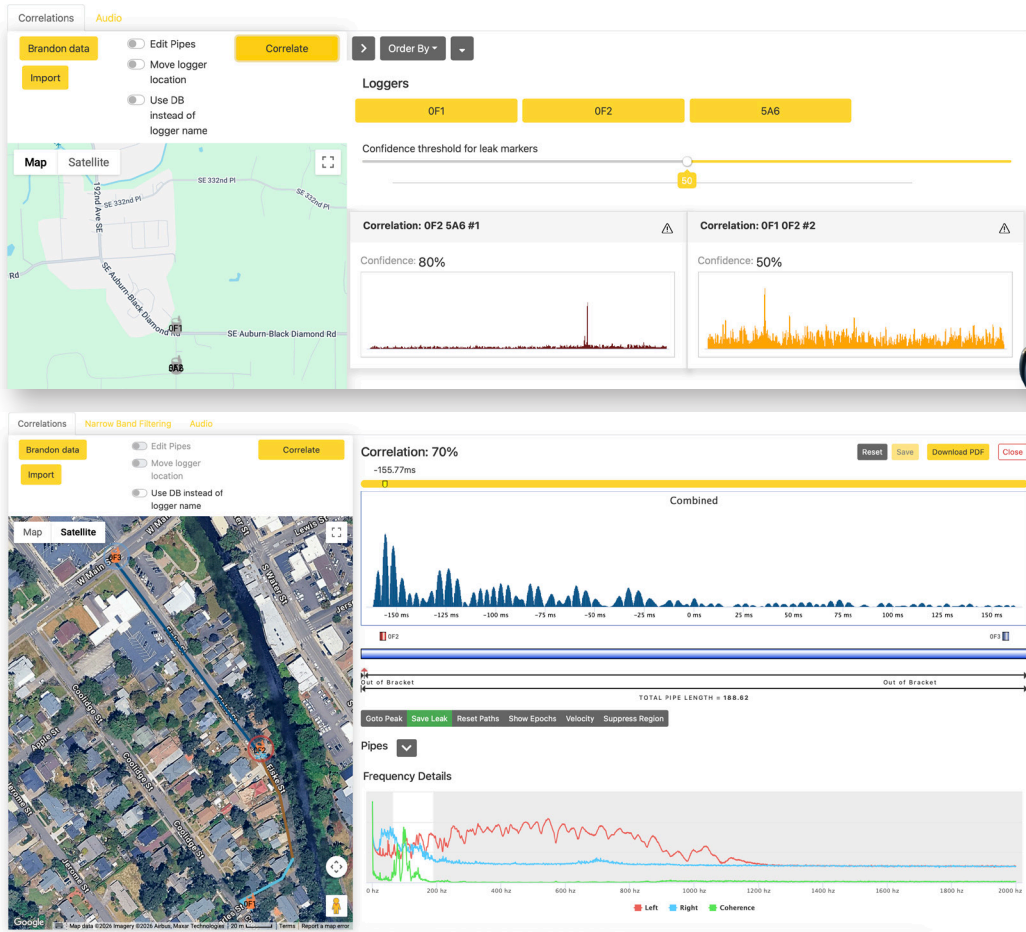


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# ENIGMA 3 STANDARD DATA LOGGERS

## CORRELATION SCREENS - CLOUD VERSION



## CORRELATION SCREENS - PC VERSION

