ENIGMA

Multi-point correlation logging system for leak location

Enigma® is a state-of-the-art digital correlation logging system for determining the location of leaks in buried water pipes. Enigma® combines noise logging and noise correlation into one operation to provide improved operational efficiency.

MULTI-POINT NETWORK CORRELATION

Enigma® loggers are deployed at multiple positions, typically on valves or hydrants, during normal working hours. They maybe programmed for either daytime or night-time operation. The loggers record the actual leak sound. When retrieved the leak sound is transferred to the host software where it is processed to display all leak positions between loggers.

Programming and data readback utilises optical and USB communications to ensure rapid operation.

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.

FEATURES & BENEFITS AT A GLANCE:

Enigma® offers the following:

- **Optimum performance in difficult leak detection situations**
- **Avoids costly night-time working**
- **Three sound samples separate leakage from genuine water use**
- **Latest 24-bit digital correlation**
- **Finds multiple leaks**
- **Low cost, high performance digital correlator**
- **Traffic friendly deployment**
- **Easy to use**
- **Logger programming/readback via PC or one button press in the Communications Case**
- **Loggers powered for 5 years**
- **Advanced filtering and coherence functions**
- **Unwanted noise suppression**
- **Auto-velocity determination**
- **Pipe schematic with correlation 'thumbnails' display**

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.

SubSurface Instruments, Inc. | 1230 Flightway Drive, De Pere, WI. 54115
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SPECIFICATIONS:

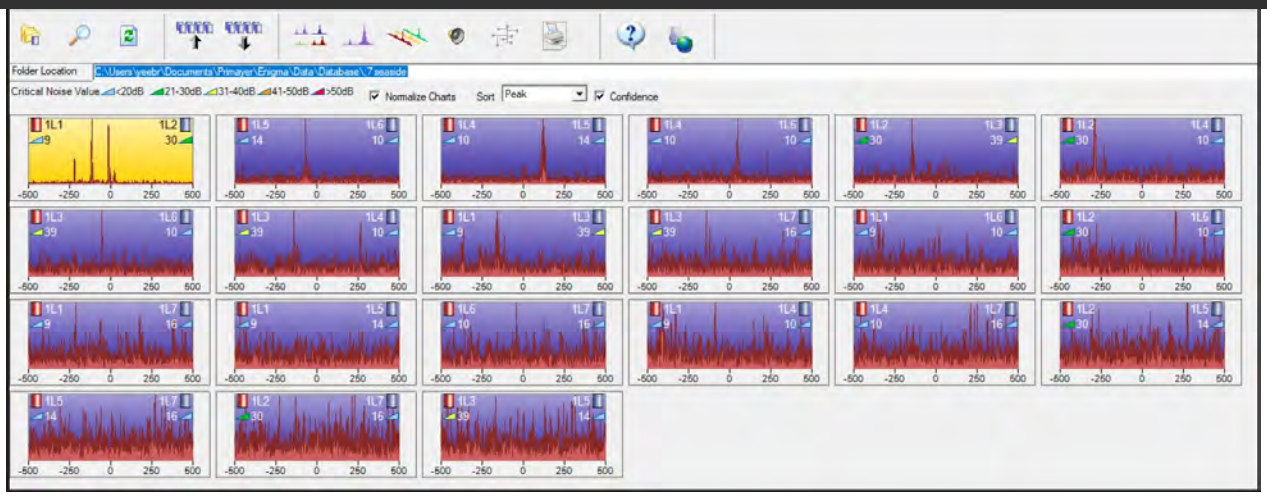
CORRELATING LOGGER

Sensor	
Type	Integral Accelerometer
Frequency range	1-2400 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 centre
Operating life	>5 years
Physical	
Dimensions	104mm (high) x 59mm (diameter)
Material	Aluminium
Waterproof	Submersible to IP68
Operating Temperature	-10°C to +60°C

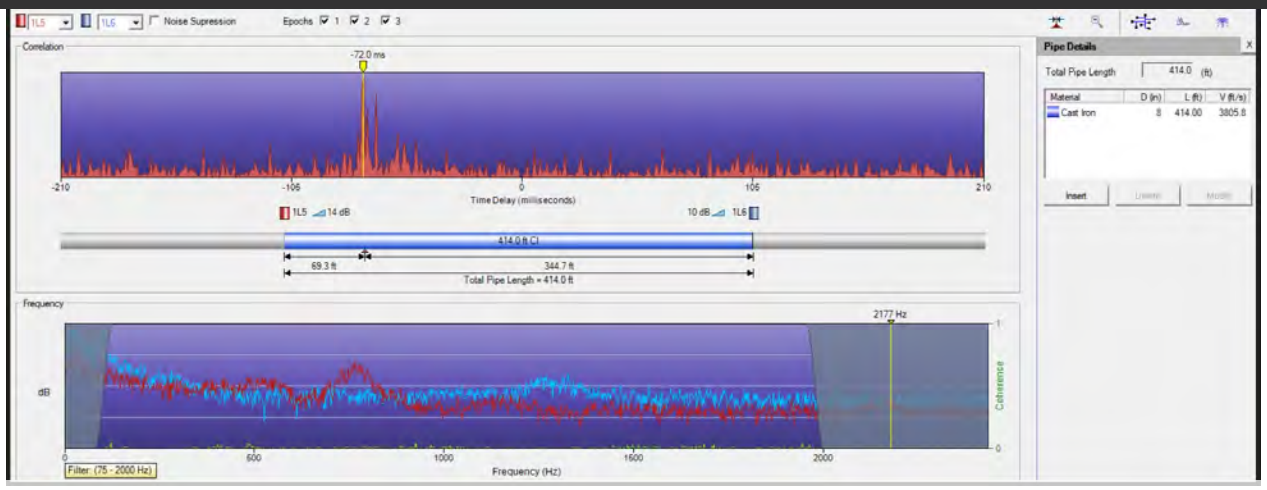
COMMUNICATIONS CASE

Host Communications	
Type	USB
Rate	2.5 Mbits/sec
Data saved into case	One run (8 correlations)
Memory	
Data store	32MB static RAM
Communications	
Type	Optical
Rate	2.5 Mbits/sec
Power Supply	
Type	User replaceable alkaline 4 cell pack
Physical	
Dimensions	8 logger: 410 x 325 x 172 mm
Material	Ruggedised high impact plastic
Waterproof	IP65
Operating Temperature	-10°C to +60°C

THREE LOGGER SCAN OVERVIEW:



INDIVIDUAL CORRELATION:



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