

Enigma®

Multi-point correlation 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.

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
- Hydrophone version for improved performance on plastic and large diameter pipes
- Latest 24-bit digital correlation
- Finds multiple leaks

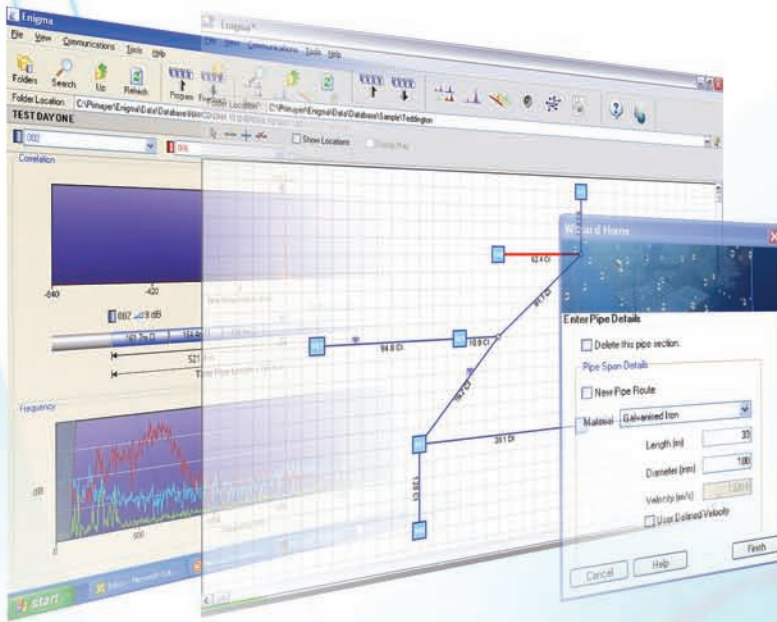
Multi-point network correlation

Enigma loggers are deployed at multiple positions, typically on valves or hydrants, during normal working hours. They may be 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.



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.



Product features

- Up to 8 loggers per system
- Loggers programmed/readback via PC or one button press in the Communications Case
- Fast logger communications
- Loggers powered for 5 years (under defined conditions)
- Loggers submersible to IP68

Host software features

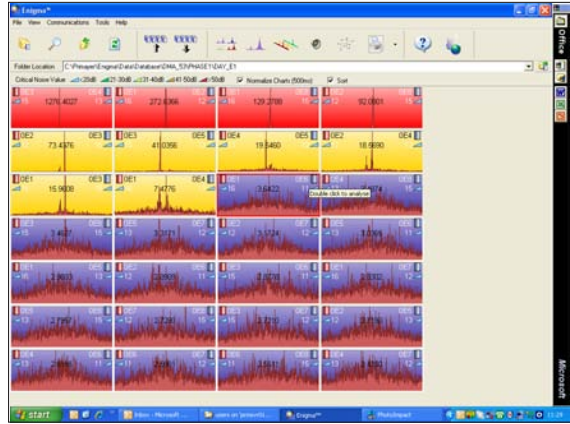
- Advanced correlation, coherence and filtering
- Windows® 'Explorer' style browser
- Logger positions shown on pipe schematic
- Automated velocity measurement



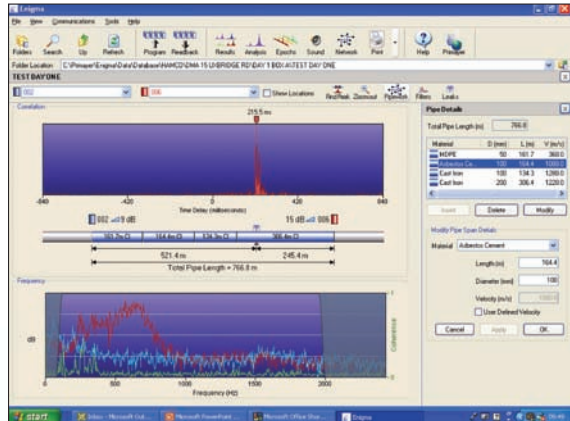
Enigma hydrophone version

Separating genuine water usage

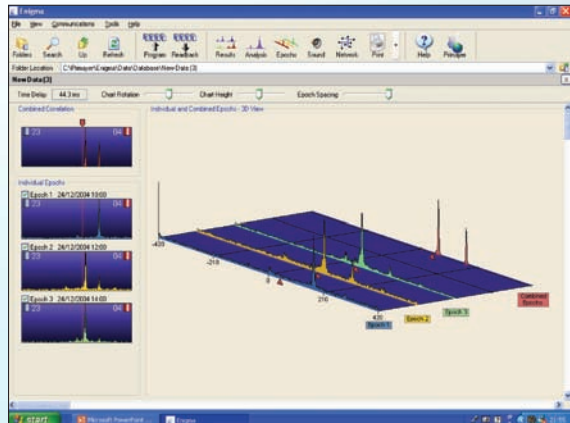
Each logger records during three sample periods, typically spaced one hour apart. A characteristic of leak noise is that it is always constant and so if the correlation peak is not present during all three samples then it is due to water use and not leakage.



Display of thumbnail results with automated sorting of leak correlation confidence



Display of pipe detail entry and correlation functions



Multiple epochs to determine if leakage or legitimate use of water

Part Numbers

Enigma Kit (8 standard loggers)	JXG 001
Enigma Hydrophone Kit (8 loggers + 8 hydrophones)	JXG 002

Primayer Limited