

Enigma[®]-hyQ

For trunk main leak location



Enigma-hyQ is a variant of the standard Enigma multi-point correlation logger that has been further optimized for leak location in large diameter pipes and over longer distances. A high sensitivity hydrophone is used (directly detects the pressure wave in the water) coupled with the application of narrow band filtering.

System Features

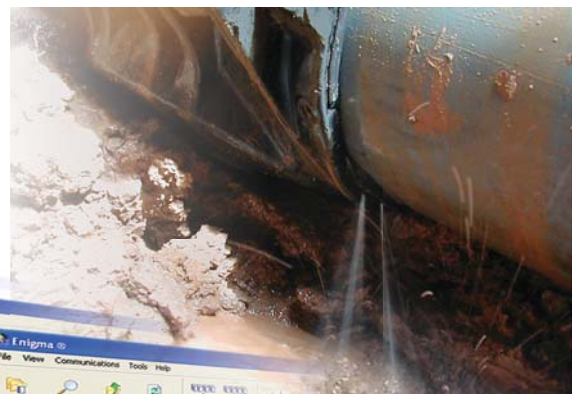
- High sensitivity hydrophone
- Narrow band filtering technique
- Very low electronic 'noise floor'
- Records acoustic data at night
- Multiple recording 'epochs'

Multi-point Correlation

Enigma-hyQ loggers are deployed during normal working hours at multiple insertion points along a main. *Enigma-hyQ* gives optimum performance by recording the leak sound at night - when background acoustic noise is lowest and water pressure is usually highest.

When retrieved the leak sound is transferred to the host software where it is processed to display leak positions.

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



technology for network management and leakage control

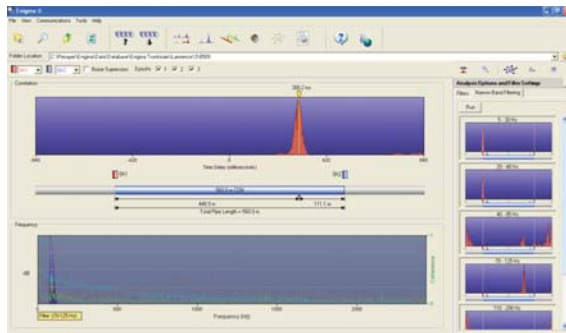
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Optimum Design

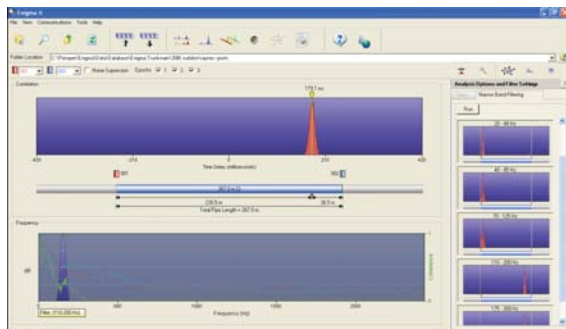
For detecting quiet leaks *Enigma* is designed with the lowest possible 'electronic noise floor' - the lowest random noise generated within the logger's semiconductors. This is coupled to the ability to process very low frequency signals.

Narrow Band Filtering

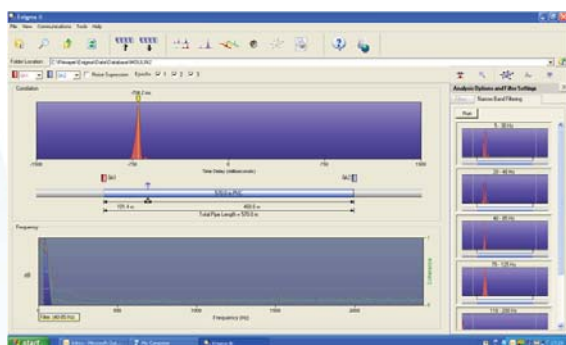
The Narrow Band Filter tool automatically 'sweeps' the frequency range and produces multiple correlations in different frequency bands (as displayed on the right side in screens below). The technique can enable results when operating over longer distances and large diameter mains).



Leak on 1500mm diameter concrete main over 560 metres (Chicago, USA)



Leak on 800mm diameter iron main over 276 metres (London, UK)



Operation also effective on plastic pipe; leak over 580m on 100m PVC pipe, Lorient France

System Features:

- 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
- Interface to Google Maps*



Part Numbers

| | |
|---|---------|
| Enigma-hyQ Compact Kit (3 loggers + hydrophones) | JXG 602 |
| Enigma-hyQ Kit (8 loggers + hydrophones) | JXG 002 |

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