NETWORK MONITORING

FLOW MEASUREMENT

LEAK DETECTION

REMOTE LEAK LOCATION

DATA DELIVERY

LOCAL LEAK LOCATION
AND CONFIRMATION

technology
guide

for water network management
and leakage control

Primayer

Issue **8**

COMPANY PROFILE

Primayer is a world leading developer and manufacturer of intelligent technologies for the effective monitoring of water networks and for reducing the loss of potable water. Our focus is only on this market. We aim to provide innovative technologies enabling effective management of water – the planet's most important resource. With over twenty years experience we are committed globally to supplying quality products for water utilities, consultants and contractors.

Innovation

Our dedicated in-house research and development team is focussed upon the design of new products and technologies providing innovative solutions. With continuing investment in this area we aim to assist with the challenges faced in water network management including the ever present need to save and conserve precious water supplies.

Quality assurance

We are focussed on the highest standards from product design through to customer service training with accreditation to ISO 9001 Quality Management System and ISO 14001 for an effective Environmental Management System. This is an investment for the long term benefit of our business and our customers.

Global presence

Primayer has modern design and manufacturing facilities in the United Kingdom plus additional sales and support facilities located in France and Malaysia. We also have distributors in over 45 countries worldwide employing highly experienced personnel. Our products are deployed in all continents and in many varying environmental conditions.

Environmental

Primayer's core business is to facilitate the reduction of wastage and to increase the provision of water, a vital resource for life. Our environmental credentials are fundamental to our success and that of our customers.

Taking every opportunity to have a positive impact on the environment is becoming more and more important, and this is influencing the way that our customers and partners approach a particular project.
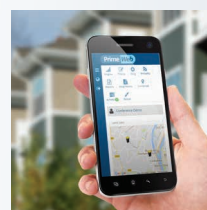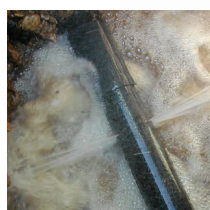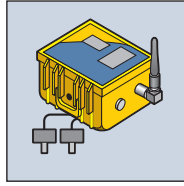
TECHNOLOGY

Network monitoring
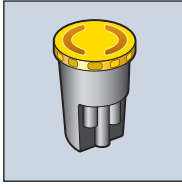
XiLog+
- District meter areas
- Consumer use
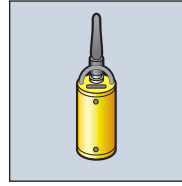- Network pressure
- Reservoir levels

Flow measurement

PrimeFlo3
- Ultrasonic flowmeter with GPRS/3G communications
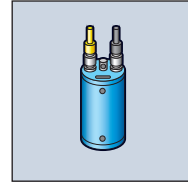- Easy to install
- Long battery life

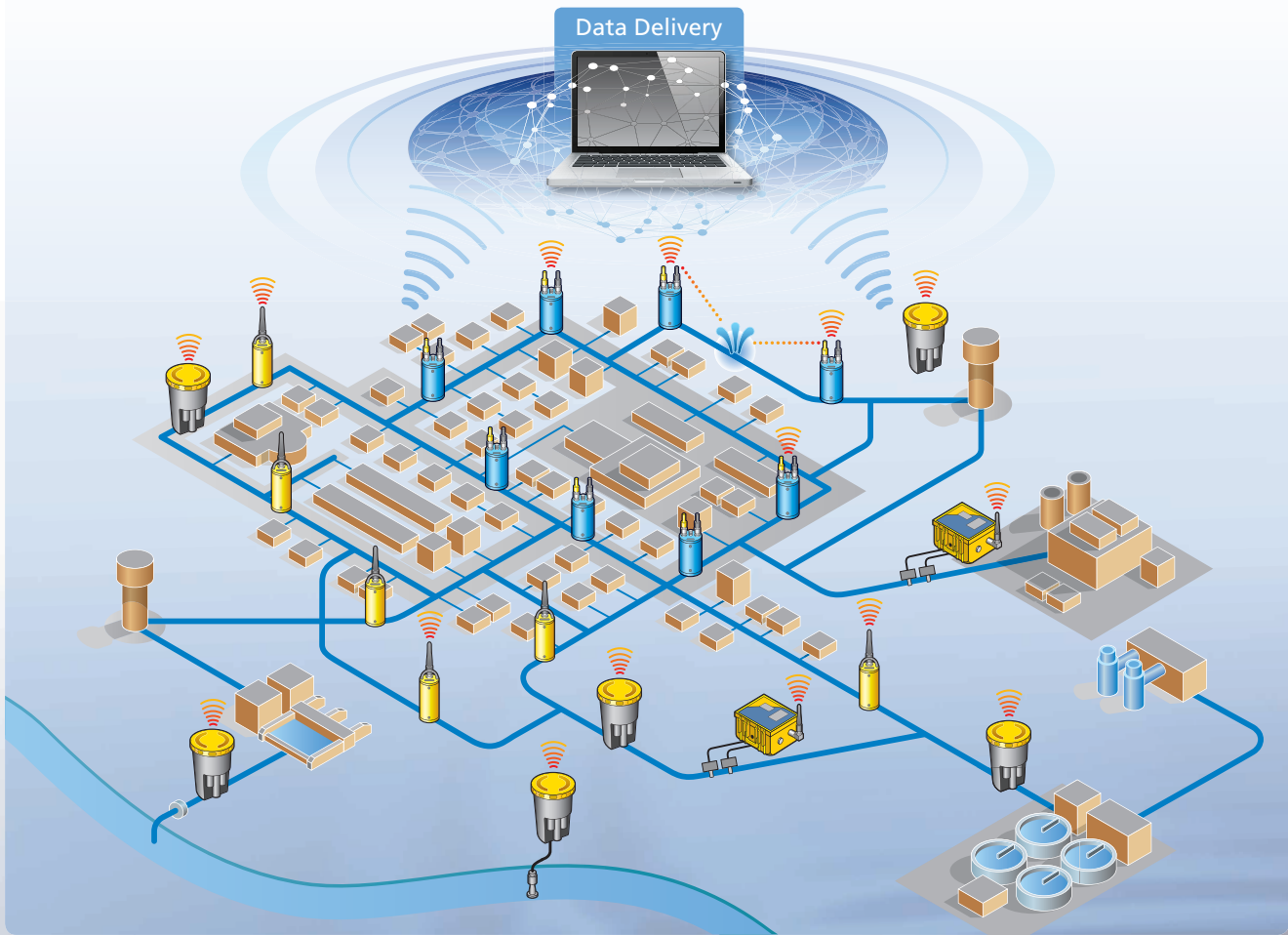## Leak detection

Phocus3
- Acoustic leak detection
- Lift and shift operation
- Drive by operation
- Remote detection

Remote leak location

Enigma3
- Automatic remote correlation via GPRS/3G
- Leak pinpointing
- Reduced leak run time

Data Delivery

Local leak location and confirmation

Xstream
- Live step-testing

Enigma
- Off-line multiple sensor correlation

Eureka3
- Realtime correlation for leak pinpointing

Mikron3
- Leak position confirmation using ground microphone

*PrimeTouch Apps option for **three instruments in one…***

XiLog+1Fm

Cost effective GPRS/3G data logger for network flow and commercial meter reading

- Ideal for commercial logging, meter reading and event logging
- Daily data transmission
- Meter index transmitted plus flowrate at 5 to 60 minute intervals
- Data available on-line
- Minimum five year battery life
- Robust and waterproof to IP68

Data delivery via PrimeWeb

XiLog +1Fm

XiLog+

Data logger range with GPRS/3G communications for multiple distribution and waste water network monitoring applications

- 1, 2, 3 and 9 channel models
- High performance state-of-the-art 'below-ground' antenna
- Data transmission down to every 15 minutes (needs external power)
- Wide range of sensors and high accuracy
- 10 year battery life (defined conditions) with high capacity double battery
- 4 Gbyte memory for rapid logging and logs at multiple intervals

XiLog+

XiLogeco

Data logger powered by water pressure

- Regular 15 minute data transmission
- Environmentally friendly
- Minimises site visits
- PRV performance monitoring
- District/zone flow monitoring
- Boundary valve monitoring

XiLog+ Data Connectivity

XiLog+ loggers deliver data onto an FTP server which may be hosted by Primayer or by the end-user

The Decode Application software delivers data direct to CSV format files or to a SQL Database for access by other systems (SQL license is supplied by others).

CSV Files

PrimeWorks

XAP Desktop

Primayer Decode API

Database

FTP Server

OPC Server

PrimeWeb
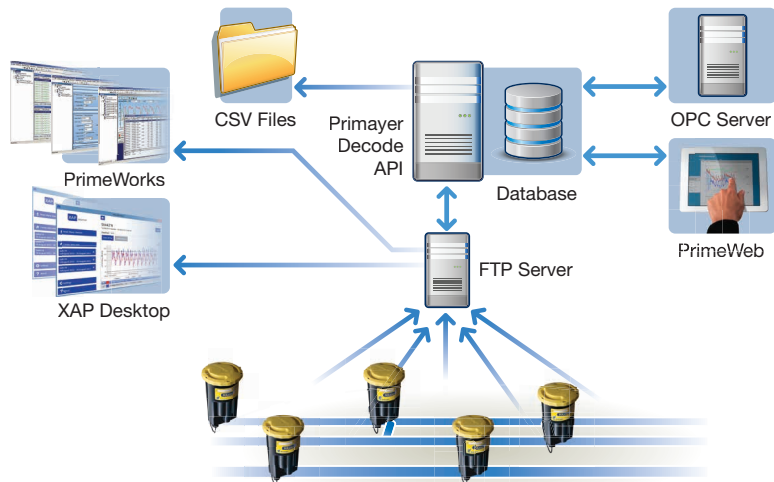
PrimeLog+

Portable data logger for water distribution and network surveys

- Compatible with all common flowmeters
- High accuracy +/-0.1% pressure measurement
- High speed USB communication
- Logs minimum, maximum and average values
- Battery life 5 years (in most applications)
- Small, robust and waterproof to IP68

XAP Display

Portable USB display for use with all **PrimeLog+** and **XiLog+** data loggers. It shows current values for each channel, minimum daily flow value and also performs pressure channel auto-zero calibration.

For use with *XiLog+* and *PrimeLog+*

Water meters

Pulse units are available for all major clean water supply meters.

Depth and pressure measurement using silicon pressure transducer

Solid state pressure transducer fitted with vent chamber. Typical applications include reservoir, borehole and river depth measurement.

Level measurement using ultrasonic sensor *

Ultrasonic pulses are reflected by the surface and received at the sensor. A common application is for depth v flow-rate determination on weirs or monitoring sewer overflows at times of excessive rainfall.

## Level measurement using radar sensor *

Sensor uses pulsed microwaves enabling high accuracy level measurement over wide range; unaffected by humidity, surface foam etc. which can create false echoes.

Open channel flow using Doppler sensor *

The Doppler method uses a continuous, ultrasonic signal sent into the water at a known angle to measure the flow velocity. Moving particles generate a frequency shift proportional to the velocity of the particles.

Overflow sensor
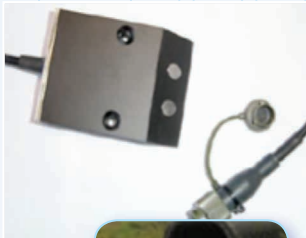
The overflow sensor is self-powered and when submerged, indicates presence of water. The system measures the time an overflow occurs. The sensor has a designed profile to avoid sediment build up.

Rain gauge

A rain gauge can give first indication of increased surface water entering the sewer network. This provides information to treatment works upon predicted increased water volumes.

Pump operation

The current clamp detects when a pump is taking electric power; thus monitoring the functioning time of the pump. The volume of water pumped is calculated from the pump run time.

*This sensor for use with XiLog+ only

PrimeWeb

**Cloud based collection and display of water distribution and waste water network data**

- Access to network pressure and flows, water usage, nightlines, leakage detection and leak location
- Dashboard displays *XiLog+*, *PrimeFlo3*, *Phocus* and *Enigma3* data availability
- Logger data and leak positions on Google Maps* and 'Streetview'
- Alarms available via email
- High cyber security
- Operation using any internet browser
- On-site data accessed via tablet or smartphone
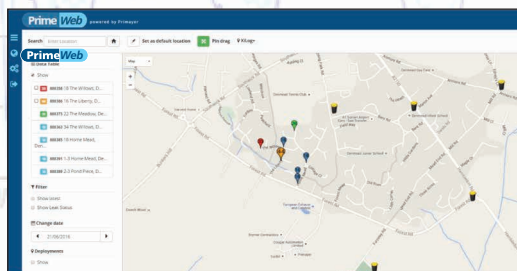
XiLog+ positions available on Google Maps*.

Network pressure + flow data available for detailed analysis.

Complete Network Communications
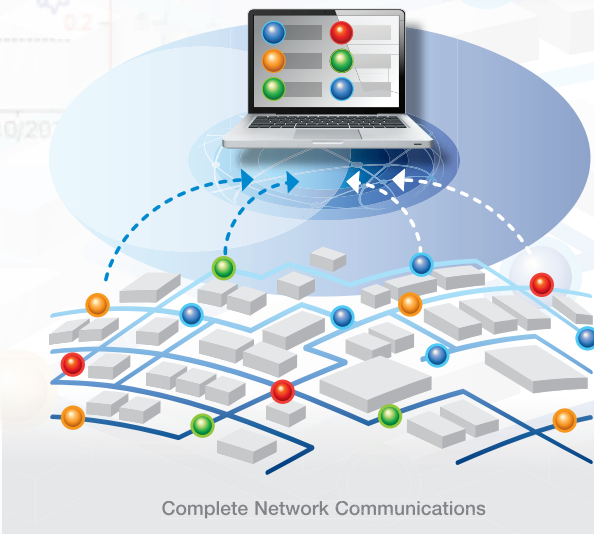
● XiLog+   ● Phocus   ● Enigma3   ● PrimeFlo3

XAP Desktop

**XiLog And PrimeLog programming and reporting for water supply and distribution applications**

- Data readback from *PrimeLog+ / XiLog+*
- Multiple logger programming/ readback via USB batch function
- Receive SMS messages
- Download FTP data
- Graphical data display

- Tabular data reporting
- Statistics information
- Data export in .CSV format

PrimeWorks

Water data management software

- Comprehensive graphing and reporting
- Extensive database control
- Data import/export
- Auto-export of data
- Interfaces with corporate systems
- Daily statistics
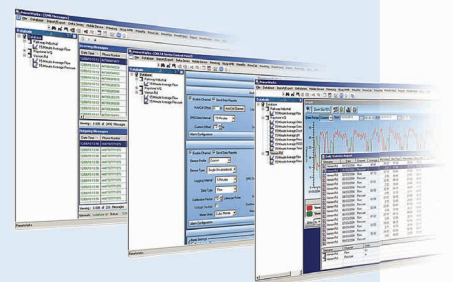
PrimeFlo3

Rugged and easy to install ultrasonic flowmeter with remote 3G / GPRS communications and long battery life

- Non-invasive flow measurement on pipe sizes 25 - 2500 mm (one pair of sensors only)
- Integral pressure transducer
- Remote communications via 3G or GPRS
- Daily on-line data availability via PrimeWeb
- Step testing mode
- Long battery life (6 months internal and 2 years external battery)

- Rugged to IP67 (lid closed) and IP68 sensors
- Integral pipe wall thickness gauge option
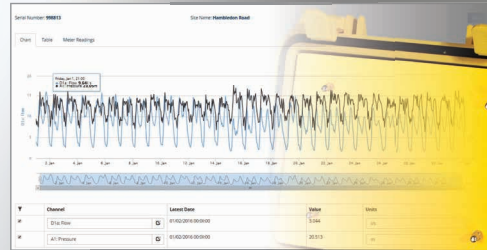
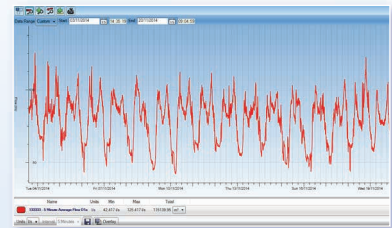Flow + pressure data available on-line via PrimeWeb.

PrimeFlo3
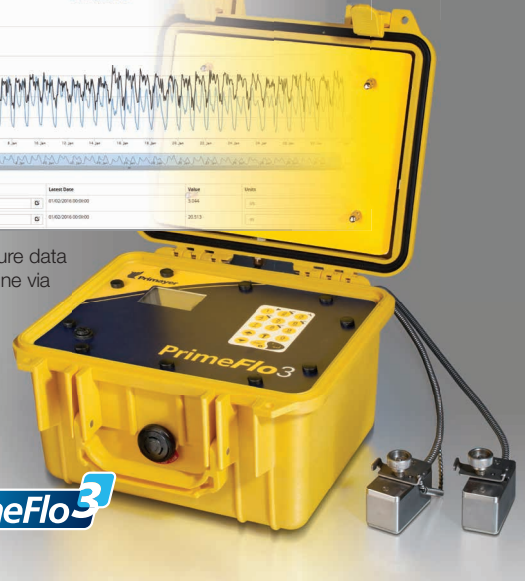
PrimeFlo-T

Compact ultrasonic meter for flow surveys

- Survey application with 24 hour battery life
- Operation on pipe sizes from 25 - 2500 mm (one pair of sensors)
- Non-invasive sensors, providing;
  - no flow disturbance
  - no process interruption
  - no water contact
- Easy set-up and installation

PrimeProbe3+

Rugged electromagnetic insertion flowmeter

- Insertion lengths available for use in pipe diameters 80 mm to > 2000 mm
- Velocity measurement to 20 mm/sec to 5 m/sec
- No interruption to water supply at installation
- Long battery life up to 10 years (dependent upon response time)
- Operation in low conductivity water
- Very rugged, for use up to 25 Bar operating pressure

PrimeProbe3+

XAP Desktop

PrimeWeb

PrimeWorks

XAP Display

PrimeLog+

XiLog+

XAP Display

Xstream

Live data streaming for step testing, PRV commissioning, network re-zoning

- Realtime flow and pressure data viewed on internet browser
- Single user operation
- No radio range restrictions
- Annotate valve closure and other operations on graph
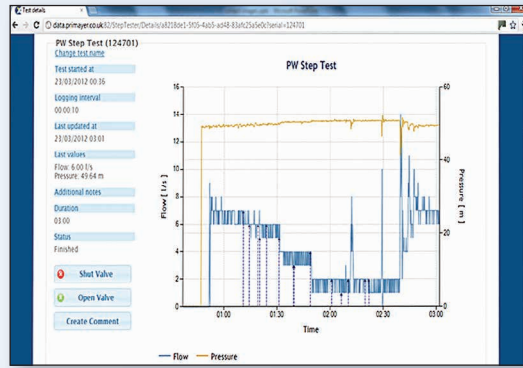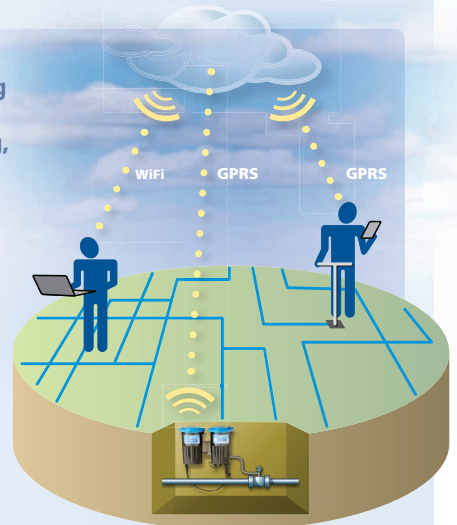
Graphing reduction detail in flow at each valve closure.

Phocus3

Advanced wireless noise logger for leak detection

- Rapid overnight identification of leaks
- Phocus noise algorithm to reduce incidence of un-detected leaks
- Leak listening
  - realtime (whilst on-site)
  - recorded to aid remote leak identification

- GPS coordinates stored in logger
- Small size
- Two models available:
  - local IR contact (lift + shift operation)
  - radio contact (greater range for permanent installation)
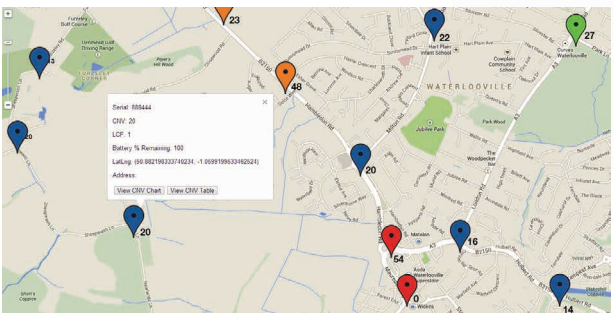
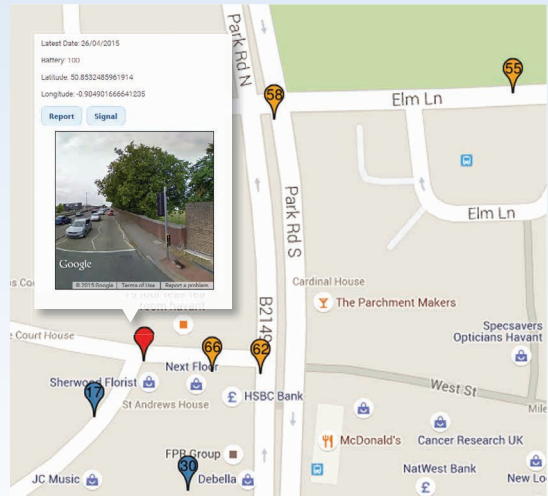Leak noise status for all loggers shown on Google Maps*.

Phocus3m

Remote leak detection utilising GPRS/3G communications

- Remote leakage identification to reduce leak run time and improve efficiency

- PrimeWeb map based data available using a web browser

- Leak confirmation audio files available for remote listening to confirm presence of leak noise

- Phocus noise algorithm reduces incidence of undetected leaks

- Three sample periods to separate usage from leakage thus reducing false alarms

- No infrastructure above ground required

Phocus3m

Data delivery via PrimeWeb


Leak noise status for all loggers shown on Google Maps*.

## Cloud based data delivery for Phocus3m, Enigma3m and Enigma3hyQ

- Access to network pressure and flows, water usage, nightlines, leakage detection and leak location

- Dashboard displays *XiLog+*, *PrimeFlo3*, *Phocus* and *Enigma3m* data availability

- High cyber security

- On-site data accessed via tablet or smartphone

- Logger data and leak positions on Google Maps* and 'Streetview'

- Operation using any internet browser

- Alarms available via email
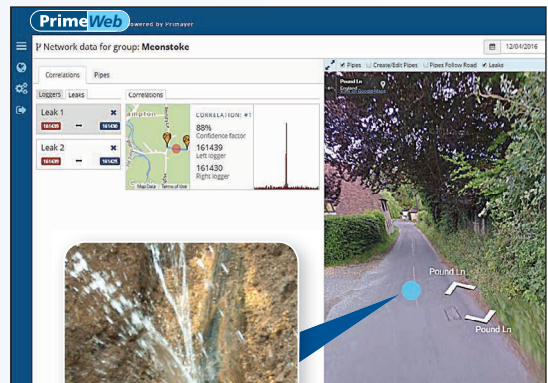
Dashboard correlation result with Streetview provides visualisation of leak location.
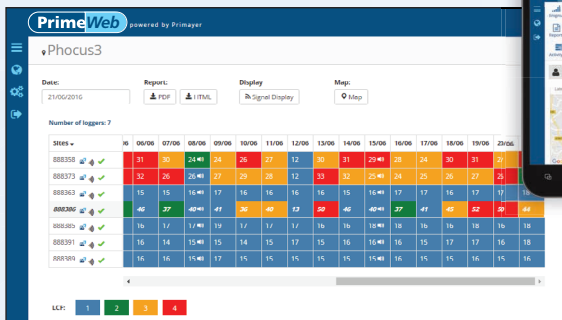
Leak status report for deployed loggers.

Dashboard view.

Complete Network Communications

XiLog+   Phocus   Enigma3   PrimeFlo3
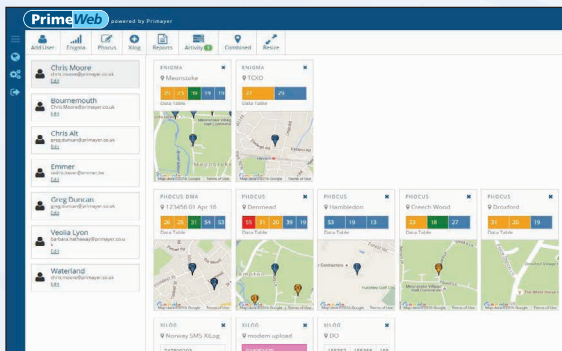
Enigma3m

Remote leak pinpointing solution

- Daily transmission for utilising 3G/GPPS communications improved efficiency and reduced leak run time
- Simple installation – no above ground radio repeaters required
- Accurate time synchronisation for leak position
- High frequency range with powerful Adaptive Filtering
- Data available at any location via PrimeWeb on a web browser
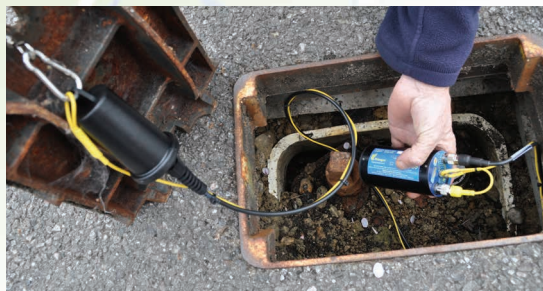- Leak listening for confirmation of leak noise
- Logger GPS location stored

Data delivery via PrimeWeb
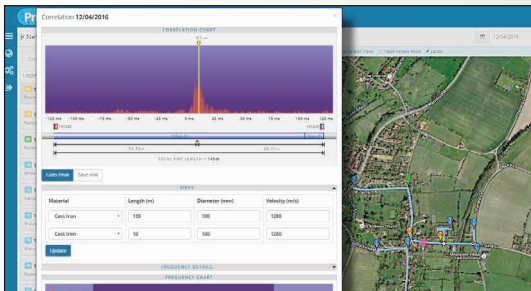
Individual correlation result with pipe details.
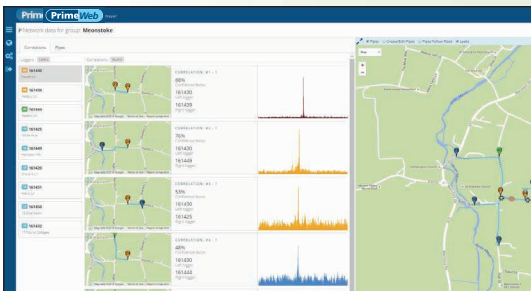
Dashboard shows all correlation results.

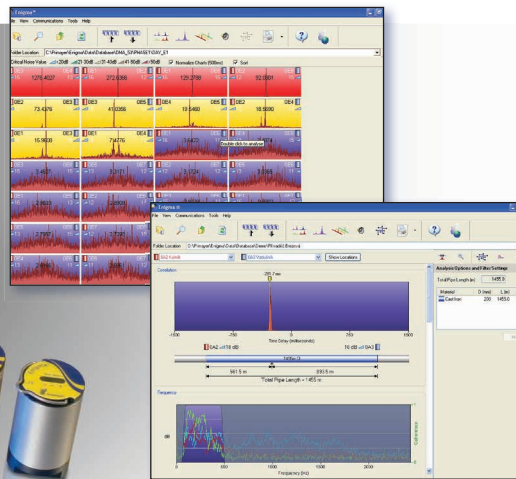## Enigma3hyQ

Incorporating hydrophone sensors for large diameter or plastic pipes

- Optimised for leak location over longer distances, on large diameter pipes and plastic pipes
- High sensitivity hydrophone
- Multi-day correlations for difficult leaks
- Auto-velocity determination for accurate leak location
- Small size for fitting into underground chambers - *no above ground installation required*
- Logger powered for 5 years (dependent upon 3G/GPRS signal conditions)

Data delivery via PrimeWeb
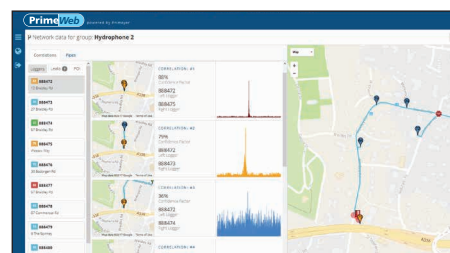
Multiple correlation results displayed with leak positions over distance of 614 metres.

Enigma

Enigma

**Multi-point correlation system for optimum leak location**

- Operation at night for optimum performance - but avoids costly night working
- Three sound samples to separate consumer use from leakage
- Can find multiple leaks
- Latest 24-bit digital processing
- Advanced correlation, coherence and filtering
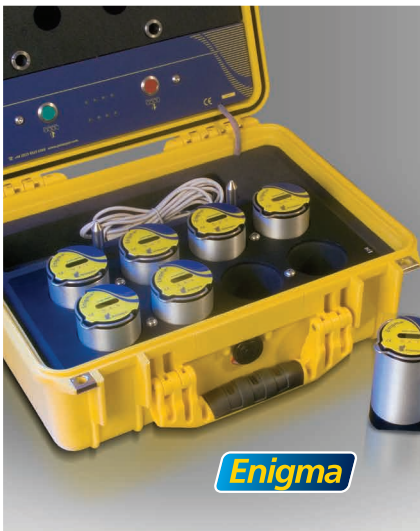
Leak located on 1455 metres cast iron pipe.

Enigma-hyQ

Optimised for leak location on large diameter pipes and over longer distances

- High sensitivity hydrophone directly detects pressure wave in the water
- Narrow band filtering technique
- No radio range limitation
- Records acoustic data at night - but avoids costly night working
- Auto-velocity determination
- Unwanted noise suppression

Trunk Main Leak Location
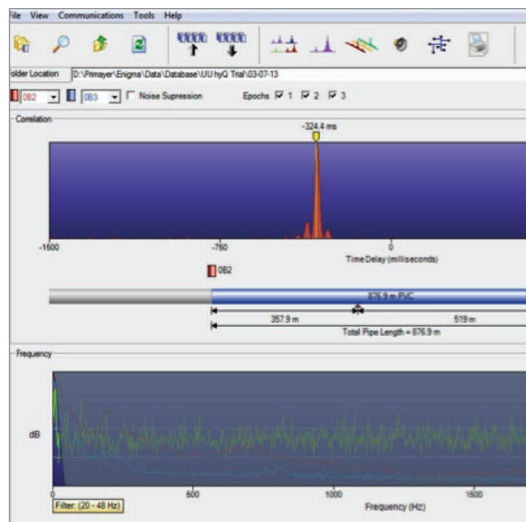
Leak located on 500 mm PVC main over 876 metres.

PrimeTouch Apps

- Realtime correlation with radio transmitters - *routine operation*
- Off-line correlation using noise loggers - *deployment over-night for difficult leaks or when pipe access difficult*
- Ground microphone listening - *for leak confirmation*
- Training app
- Ideal for plastic pipes, large mains and over longer distances

Realtime and off-line correlation plus ground microphone
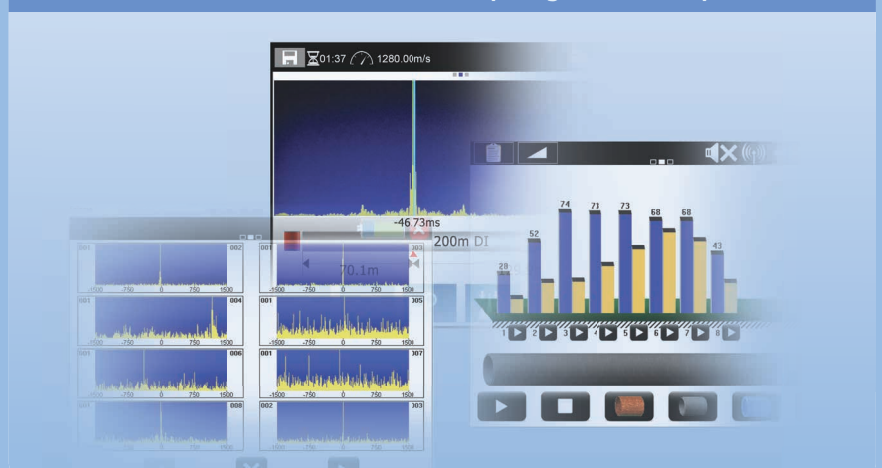
Eureka3

**Leak location correlator with touch screen operation**

The *Eureka3* operation on the *PrimeTouch®* platform ensuring easy operation involving the minimum actions to achieve optimum results.

- 16-bit digital correlation processing
- Interactive pipe model, correlation and coherence spectrum displays
- Velocity correction function
- Optional direct transmitter connection to pipe (street working friendly)
- Post-processing analysis using powerful *Enigma®* software
- Compact, with in-case battery charging

Eureka3+

Powerful Adaptive Filtering

The Adaptive Filter operates live in the frequency ranges selecting the optimum correlation. This enables location of difficult leaks missed using conventional filters.
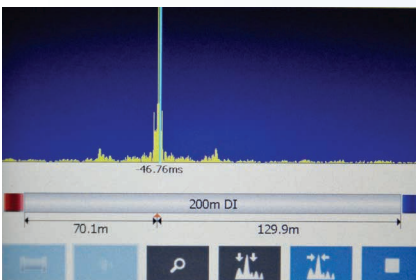
Clear correlation display of leak position.

Three instruments in one... the complete leak location solution

Enigma
Off-line multiple sensor correlation on difficult leaks or when access is difficult

Eureka3
Realtime correlation for leak pinpointing

Mikron3
Leak position confirmation using ground microphone

Mikron3

Flexible technology for acoustic leak location

- High quality piezo sensors for optimum sound quality
- Wireless sensor communications for reduced airborne noise pick-up
- Choice of sensors;
  - Ground microphone
  - Listening rod
  - Accelerometer
- Dynamic listen control for hearing protection
- Choice of three processors;
  - Mini
  - Pro
  - PrimeTouch App
- In-case battery charging

Mikron3 Junior

Entry level acoustic system for leak pre-location and location

- Clear visual display of leak noise strength
- Adjustable filter frequency ranges for minimum interference
- Airborne noise reduction achieved via sensor cable ball and foam cover
- Test rods for pre-location at fittings and ground plate for use on variety of surfaces
- Dynamic listen control for hearing protection
- Compact and lightweight
- Carry case may also be used as back-pack
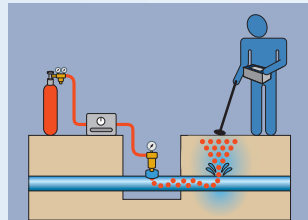
LOCAL LEAK LOCATION AND CONFIRMATION

Hykron
Leak listening system

- High acoustic sensitivity
- Easy operation
- Low cost
- Durable construction
- Alkaline battery with easy field replacement

LOCAL LEAK LOCATION – TRACER GAS METHOD

PrimeTrace
Leak location using hydrogen tracer gas

- Semiconductor sensor with resolution of 0.1 ppm
- Incorporates powerful pump to aid tracer gas detection
- Compact user friendly design
- Specialised probes for different applications
- Self-test feature to check sensitivity

- Injection box enables optimum control of gas injection with differing pipe sizes, pressures and flow-rates

PIPE LOCATION

CScope
CXL3 / SCA3
General purpose Cable Avoidance Tool and signal generator

The *CXL3* Cable Avoidance Tool (C.A.T.) is a classic style, industry standard locator which every ground working operative will find familiar and easy to use for detecting pipes and cable prior to excavation.

MXL4 / MXT4
High performance precision pipe and cable location

The *MXL4* precision locator and the *MXT4* transmitter represent a significant advance in water pipe detecting capabilities.

- Automatic daily self-test
- Improved locator performance
- Data logging
- Depth measurement
- Multi-frequency
- Yearly calibration not required

Technology with a global reach

Primayer has modern design and manufacturing facilities in the United Kingdom plus additional sales and support facilities located in France and Malaysia. We also have distributors in over 45 countries worldwide employing highly experienced personnel.

Primayer Limited
Primayer House, Parklands Business Park
Denmead, Hampshire PO7 6XP, United Kingdom
T +44 (0)2392 252228   **E** sales@primayer.co.uk

Primayer SAS
1, rue Louis Juttet
69410 Champagne Au Mont D'or, France
T +33 (0)4 72 19 10 62   **E** contact@primayer.fr

Primayer Sdn Bhd
21-A, Jln Anggerik Vanila X31/X,
Kota Kemuning, 40460 Shah Alam,
Selangor, Darul Ehsan, Malaysia
T +60 (0)3 5121 2428   **E** sales@primayer.my

www.primayer.com

IWA **Institute of water**

Primayer

water network management and leakage control

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