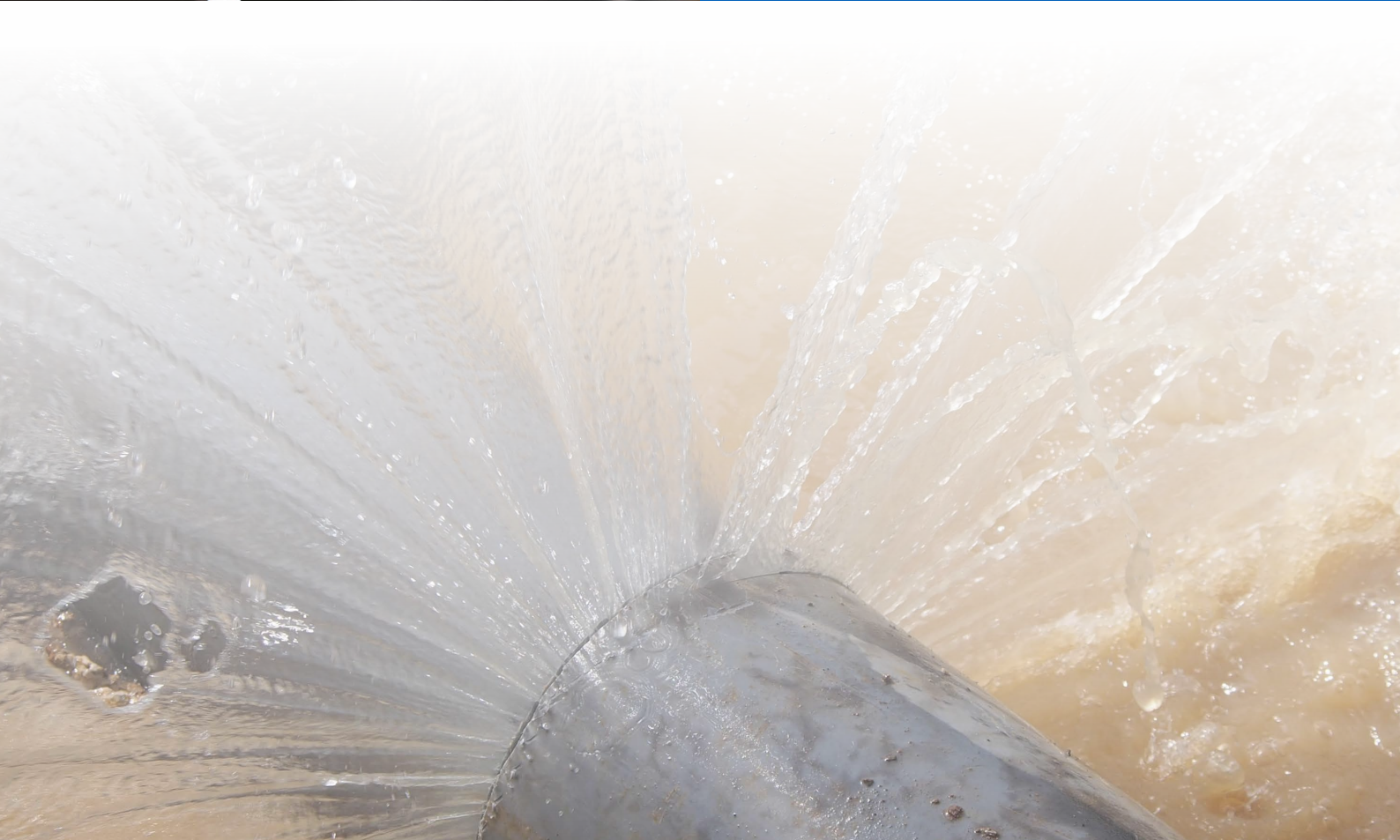




Experts in Clean Water Monitoring

for long-term monitoring
and surveying in
clean water networks

PRODUCT CATALOGUE - 2022



MONITORING ASSETS, DELIVERING DATA, BRINGING CONTROL

Who are HWM?



We are experienced and respected manufacturers of monitoring and telemetry equipment for water, wastewater and gas networks, together with telemetry AMR and facilities optimisation products.

Having serviced the clean water industry for nearly 40 years, we have combined advanced cellular communications technology with rugged, purpose-designed hardware to deliver a wide variety of robust and efficient network monitoring solutions.

We are dedicated to achieving our aim of **helping customers to save natural resources and reduce CO₂ emissions.**



Based out of our Head Office in South Wales, which incorporates a 400 year old, Grade II listed farmhouse, we design, test and manufacture all of our network monitoring solutions in-house.

We boast an innovative manufacturing facility and a dedicated production team, allowing us to deliver our industry-leading products to customers quickly.

Our unique Head Office also houses our advanced testing and development equipment. This includes our complex new test rig and our industry-renowned external leak site.



The test rig, which was developed to meet our own specifications, is built in three parts and allows the replication of a variety of network conditions. Our team of engineers and technical specialists use the test rig to support development of new technologies and to test upgrades of current products.

Our leak site is an underground network of pipes and valves designed to simulate leaks and generate authentic leak noise. While our technical teams use the leak site for product development, it is also a great facility to help train customers in leak noise detection.

Why monitor **Clean Water Networks?**

Demand for clean drinking water is rapidly increasing, while water networks are being challenged by environmental factors such as climate change and population growth.

Leak detection is a proven method of safeguarding water. If leaks are not detected quickly then immense quantities of water may be wasted. Significantly, it is estimated that 90% of leaks never show at ground level, making them much harder to identify.

Network monitoring can also be used for the prevention of leaks. Efficient **pressure management** can reduce the strain on a network, reducing pressure spikes and preventing bursts.

How do we monitor **Clean Water Networks?**

We have developed an innovative range of clean water network monitoring products that fall under the following categories:



Leak Detection

Wide-ranging leak detection solutions, including award-winning acoustic noise loggers, correlators and electronic ground microphones



Pressure Monitoring

Two-way communicating devices that support remote management of pressure reducing valves



Data Logging

Market-leading loggers that use advanced cellular telemetry to securely deliver customer data



Water Quality Monitoring

Smart digital sensors to continually measure residual chlorine, turbidity, pH, conductivity, dissolved oxygen temperature and more

Leak Detection

Demand for clean water is growing.

In the UK, daily demand for water is expected to rise by almost 30% (from 14bn litres to 18bn litres) by 2050, due in no small part to population growth and climate change.

The reduction of network leakage has been identified as a critical factor in achieving water sustainability and at HWM we work proactively with water companies to deliver large-scale network monitoring projects.

We design and manufacture a wide range of accurate and efficient leak detection solutions that includes:



**Fixed Telemetry
Network Monitoring**



**Semi-permanent
and Portable**



**Ground
Microphones**



**Surveying and
STEP testing**

PermaNET SU

LTE-M & NBIoT-enabled Correlating Noise Logger

PermaNET SU: the innovative new correlating leak noise logger

Retaining the industry leading features of the PermaNET+ system, PermaNET SU combines a leak noise sensor and telemetry technology into a compact single unit.

Designed specifically for smaller and more challenging installation areas, PermaNET SU is fully compatible with PermaNET Web, the online data viewing and analysis platform, combining to provide map-based display, GIS interface and full audio and correlation facilities.



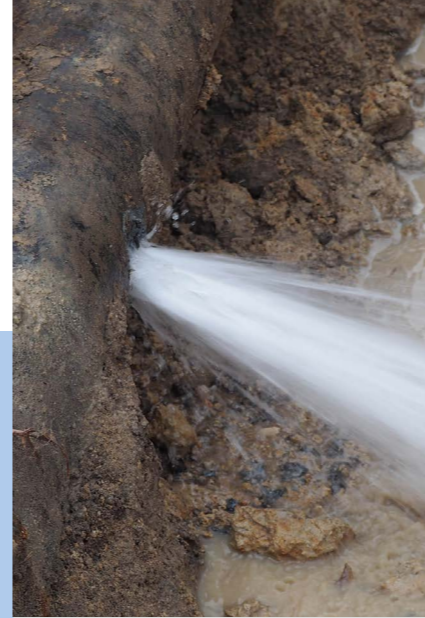
Key Features and Benefits

- fixed network monitoring continually scans for leaks
- full underground installation with remote cellular communication
- auto-correlation functionality automatically locates leak position
- designed specifically for smaller and more challenging installation areas
- works with HWM Deployment app for fast and accurate installation
- compatible with PermaNET Web online viewing platform, supporting:
 - correlation
 - Google Map view
 - Aqualog
 - GIS Interface
 - remote reconfiguration
 - audio sound playback
 - logger removal alarm

“PermaNET gives us a much greater understanding and visibility of what is happening in some of the areas most prone to leaks. By installing these devices we will potentially help our Leakage Technicians save millions of litres of water”



Martin Hattersley
Head of Water Leakage Operations



Case Study: United Utilities rolls out biggest ‘acoustic project’ of its kind

by installing 70,000 PermaNET units, with a plan to expand coverage in APM7

The Challenge

From Crewe to Carlisle, United Utilities supplies over 1.9 billion litres of water every day through its 26,000 mile pipe system. Maintaining a network of this size and actively reducing non-revenue water (NRW) is a challenge that United Utilities is proactively tackling.

The Solution

Following discussions with HWM, United Utilities conducted a trial project by installing 2,000 PermaNET+ fixed network telemetry devices in Liverpool and Manchester city centres.

The trialling of the technology was deemed to be a great success and the 2,000 PermaNET+ units are already thought to have saved up to 5 million litres of water per day.

As a result of this impressive trial, United Utilities made the decision to install a further 44,000 PermaNET+ acoustic loggers across their network, with the potential for further deployments during AMP7.



Customer
United Utilities



Product
PermaNET+



Application
- Leak Detection
- Fixed Network



“By 2020 we will have the largest estate of acoustic logger technology in the world.”

Every quarter of a mile on our water network we will be able to glean real-time data, allowing us to respond faster and more accurately when a pipe begins to leak”

Kevin Fowlie
Network Delivery Director

Between July 2019 and March 2020, phase one of the deployment saw 44,000 PermaNET+ devices installed across the North West of England.

A second phase of installations, between November 2020 and March 2021 saw the fleet expanded to 70,000 units with the deployment of 26,000 NBIoT-enabled PermaNET SU leak noise loggers, making the United Utilities network one of the largest in the world to be monitored by fixed acoustic logging.

Fixed Telemetry Products



PermaNET SU

Retaining the industry-leading features of PermaNET+, PermaNET SU combines a leak noise sensor and telemetry technology into a compact single unit.

PermaNET SU is designed for small installation areas and is fully compatible with PermaNET Web.



PermaNET+

PermaNET+ combines a leak noise sensor with our versatile telemetry technology to create a fixed network to monitor leakage.

Once a leak is detected, PermaNET+ generates an audio sound recording which can be used for remote correlation.

What is NBloT and LTE-M?

NBloT stands for **Narrow Band Internet of Things**

Narrow Band is a radio frequency developed specifically to handle small data packets from a vast number of transmitters (such as data loggers) all at the same time.

Internet of Things is a broad term that commonly refers to devices or products that are connected to the internet.

LTE-M stands for **Long Term Evolution for Machines**

LTE-M is a standard for narrow-bandwidth cellular communications, specifically for connecting resource-constrained devices to the internet.

The benefits of using NBloT and LTE-M

Using NBloT and/or LTE-M for data transfer has a number of benefits, which is why we have incorporated NBloT and LTE-M into our telemetry data loggers.

- **Future-proofing** Our telemetry data loggers use NBloT as standard with a 2G fallback should an NBloT signal become unavailable. Including NBloT now future-proofs our loggers against the eventuality of the 2G signal being switched off.
- **Low Power** Narrow Band data transfer is low power, meaning less battery power is used for transferring data and expanding the longevity of the logger.
- **Greater Coverage** Newer data transfer technologies, such as NBloT, are able to provide improved coverage for devices to all in.



PermaNET+ Hydrophone

The PermaNET+ Hydrophone system replaces the leak noise sensor with a hydrophone sensor to create a continuous monitoring system for sensitive pipelines.

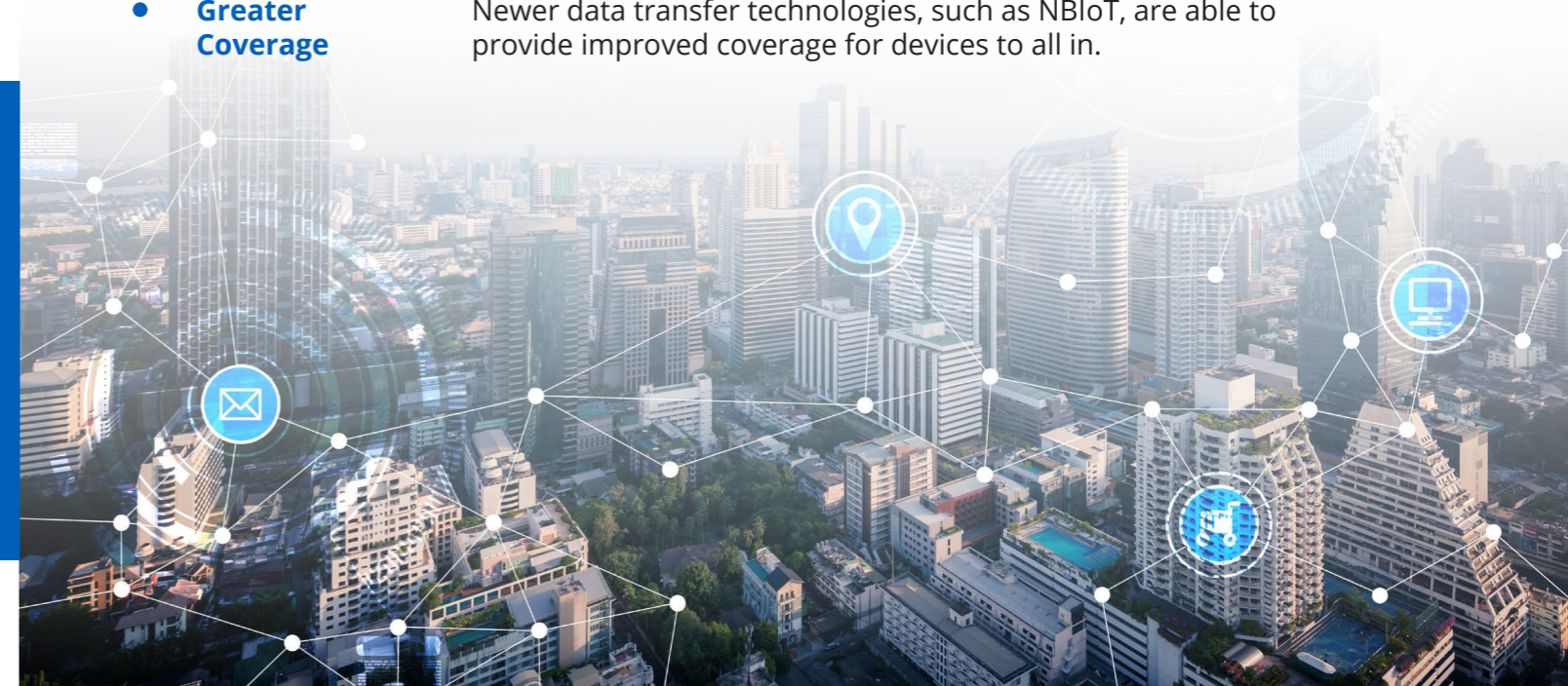
PermaNET+ Hydrophone is compatible with PermaNET Web for quick access to data.



PermaNET Web

PermaNETWeb is a digital platform created to gather, collate and easily display the leak noise data collected by PermaNET devices.

PermaNET Web is secure, easy to use and available on any internet-enabled device.



Portable Leak Detection



There may be occasions or circumstances, when monitoring for leaks, in which the fixed network telemetry delivered by PermaNET is unsuitable or unnecessary.

For situations when this might be the case, we have developed an effective portable leak detection system, built around our dynamic PCorr+ device.

How the PCorr+ system works



Initially, leakage teams populate areas of the water network with easy to install **PCorr+** devices. The loggers instantly go to work, recording sound files at set intervals, storing the data until it is collected.

Data is collected from the deployed PCorr+ devices using a **Patroller 4** wireless transceiver. Rapid data download via radio means that PCorr+ data can be downloaded through both 'drive-by' or lift and shift operation.

From Patroller 4, data is uploaded to the **WebCorr** mobile app, allowing in-field access.

WebCorr uses a wireless connection for the uploading of data, so no internet connection or access to the DataGate server is required.

WebCorr contains a variety of features to deliver in-field correlation of leak noise data, including a Manual Intelligent Filtering System (MIFS), map view, pipe material and pipe length dropdown options and our Aqualog noise histogram.



PCorr+
Correlating Noise Logger

- Simple to install
- Records sound files
- Wireless data transfer
- IP68 rated



Patroller 4
Wireless Transceiver

- Drive-by data collections
- Portable and discreet
- Easy to use



WebCorr
In-Field Correlation App

- Wireless data transfer
- No internet connection needed
- Leak noise correlation
- Manual Intelligent Filtering
- Mixed material options
- Aqualog histogram

Touch Pro

High Performance Correlator

Touch Pro: advanced leak noise correlator for difficult leak detection situations

Especially effective on plastic or large diameter pipes, Touch Pro features a unique Automatic Intelligent Filtering System which runs up to 55 different filter combinations on each correlation.



Key Features and Benefits

- obtains best results by automatically optimising filters
- delivers cleaner and faster optimisation results
- step by step menu system guides user through correlation process
- upgraded long-range telemetry



Touch Pro TM Trunk Main Correlator

Touch Pro TM is supplied with Hydrophone sensors and specifically designed amplification for trunk main leak detection.

- specially designed hydrophone and amplifier technology
- high quality long-range telemetry
- faster and cleaner correlation results



Portable Leak Detection Products



PCorr+

PCorr+ is a compact device that provides both leak noise logging and correlation in one complete, portable system.

Paired with mobile app WebCorr, PCorr+ provides the ability to record and replay sound files, as well as in-field data correlation.



Patroller 4

Patroller 4 is a discreet, wireless Bluetooth-compatible transceiver used for the collection of data from PCorr+ and Permalog+ devices.

Compatibility with WebCorr supports on-site correlation and data upload to PermaNET Web.



Touch Pro

Touch Pro is an advanced leak noise correlator designed specially for the more difficult leak detection situations, including plastic or large diameter pipes.

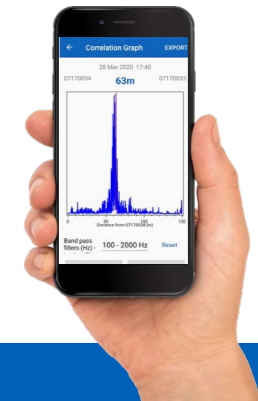
Intuitive to control, Touch Pro is effective for accurate correlation.



PCorr Lift & Shift

PCorr Lift & Shift is an entry level leak detection device that records pipe sounds at pre-set intervals.

Data is collected from PCorr Lift & Shift with Patroller 4 to be viewed in graph format, helping the user to distinguish clearly between leak and non-leak noise.



WebCorr

WebCorr is a mobile application that delivers rapid in-field correlation of data collected by PCorr+ data loggers.

Using wireless connectivity to retrieve data, WebCorr can quickly provide correlation of leak noise for effective leak location.

Ground Microphones



DXmic Pro

Digital Ground Microphone

DXmic Pro: latest generation digital ground microphone

Delivering the highest quality sound, DXmic incorporates a wide variety of features to help pinpoint a leak position, including auto filtering and frequency display.

DXmic Pro goes further, supporting the recording of leak noise, including the ability to replay recordings, and is also compatible with the DXmic App.



Key Features and Benefits

- high quality digital sound
- clear multifunctional graphics; can be used with gloves
- improved automatic filtering supported by frequency analysis display
- download results to DXmic Pro app and replay leak noise recordings
- compatible with most wireless headphones
- rechargeable batteries with up to 25 hours battery life
- safety noise level cut-off ensures protection should probes be dropped or mishandled
- auto filter function sets filters around peak noise

DXmic Pro App

Data Sharing Application

The DXmic Pro app is a mobile application developed to simplify the process of data retrieval from DXmic Pro devices.

- remote reporting through immediate data transfer
- allows for GPS information, images and notes to be reported
- data shared easily via e-mail or DataGate upload



Ground Microphone Products



DXmic Pro

DXmic Pro is the latest generation digital ground microphone developed to precisely localise the position of a leak.

Delivering the highest quality sound, DXmic incorporates a wide variety of features, including auto filtering and frequency display.



DXmic Pro App

The DXmic Pro app is a mobile application developed to simplify the process of data retrieval from DXmic Pro devices.

Through the app, DXmic users can immediately share downloaded audio files and site reports via e-mail or through DataGate.



Bmic

Bmic is an easy to use, electronic leak monitoring tool ideal for general water leak detection operations.

Bmic is a cost-effective, simple tool designed to minimise disruption and reduce repair times for any leakage technicians.



Tmic

Tmic is a pocket-sized water leak detection device developed for effective, on the spot network monitoring.

Lightweight and portable, Tmic discovers and amplifies leak noise that is otherwise inaudible to the human ear.



Lmic

Lmic is an easy to use combined electronic listening stick and ground microphone.

Ideal for general sounding operations, Lmic can be fitted with either a tripod foot or probe rods to deliver excellent leak detection performance.



Case Study: DXmic Pro's noise filtering function quickly pinpoints difficult to find leak

avoiding traffic chaos at busy intersection

The Challenge

During a Water Leak Location Services project for Portsmouth Water, a newly installed PermaNET+ unit detected the presence of a leak in a section of 300mm ductile iron pipe underneath a busy stretch of road in Waterlooville.

This particular leak was a concern as the pipe was located at a junction and digging up the road to fix the leak would require traffic management, causing disruption to the road users.

While traffic management is often an unavoidable consequence of leak repair, in this instance Portsmouth Water was intent on keeping any disruption to a minimum.

Pinpointing the exact location of the leak to ensure the repair takes as little time as possible was critical, but in this case, the high volume of traffic at this junction was causing a problem. Although PermaNET+ could indicate the presence of a leak, traditional listening methods were ineffective as traffic noise was too loud and was masking the leak noise.

The Solution

To pinpoint the exact location of the leak, Water Leak Location Services used the DXmic Pro Ground Microphone from HWM.

Delivering the highest quality sound recordings, DXmic Pro includes a noise filtering function which helped enormously in this instance.

Utilising the advanced noise filtering function delivered by DXmic Pro, the Water Leak Location Services team was quickly able to filter out traffic noise and accurately locate the leak.

Accurately locating the leak quickly had multiple benefits for Portsmouth Water, including cost savings from keeping both excavation and time on site to a minimum.

"DXmic Pro has assisted us to confidently confirm the precise location of leaks, meaning repairs are carried out with minimum disruption and cost to the water utility."

These results allow our reputation as a specialist leak detection service provider to grow"

**Andrew Mackenzie
Water Leak Location Services**



Customer

Water Leak Location Services
Portsmouth Water

Industry



Product

DXmic Pro



Application

- Leak Detection
- Portable



Surveying and **STEP** Testing



SoundSens *i* Multi-Point Correlation System

SoundSens *i* is a multi-point correlation system designed to accurately identify the position of a leak.

Designed for high performance, versatility and speed, SoundSens *i* records overnight to provide the best results in noisy, urban environments.

SoundSens *i* is ideal for both sound logging survey work and accurate pinpointing of leaks via multi-point correlation.



Key Features and Benefits

- no software required - users can set up loggers and download data without using a PC
- large memory means large quantities of data can be stored before PC download is necessary
- high performance multi-point correlation

MAST II Mobile Advanced Step Test

MAST II is a radio-based system that delivers immediate notification of flow change as a valve is operated.

This allows potential leak areas to be quickly identified and quantified, avoiding the need to complete a full step test for later comparison with logged data.

MAST II builds on the success of the MAST system, featuring a more portable, user-friendly unit with improved radio telemetry.



Key Features and Benefits

- real-time data delivers instant response to flow change
- highly accurate on plastic pipes
- data storage and valve closures are time-synchronised with graphical results

Pressure Monitoring

Ensuring adequate network pressure is critical in both delivering clean water and reducing pipe bursts.

Effective pressure management and Pressure Reducing Valve control can incorporate a number of different techniques, from simple fixed pressure outlet to sophisticated closed loop modulated control.

We design and manufacture a variety of sophisticated pressure monitoring solutions that includes:



Pegasus 2



Sentinel 2



Pressure Transient



PressView



Pegasus 2

LTE-M & NBloT-enabled Pressure Control System

Pegasus 2 is an advanced pressure control system that utilises our innovative modem (connecting via LTE-M, NBloT, 4G, 3G and 2G) for reliable and low-powered two-way communication.

With the capability to set target pressure by time, flow or a combination of both (with different table settings per day), Pegasus 2 delivers a sophisticated level of targeted control, even on a time basis.

Pegasus 2 features a secondary channel for fast logging down to 25Hz. This is invaluable for investigating system transient events.



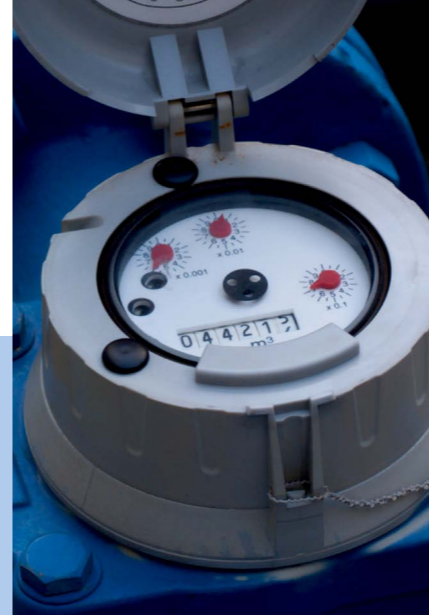
Key Features and Benefits

- NBloT/LTE-M based cellular communication as standard with fallback 2G capability
- great flexibility to remotely modulate pressure according to demand throughout the day
- built-in pressure failsafe, set at installation, including on-site manual safe override
- intelligent pressure control proven to minimise leakage and reduce the frequency of pipe bursts
- optional latching solenoids to fully vent the PRV top chamber in tight headloss conditions
- secondary logging channel enables one second fast logging for analysis of events along with Pseudo logging and transient captures
- optional 4th logging channel to record top chamber PRV pressure
- PressView platform allows easy set up and programming functionality

“Pegasus is a really good, simple system that allows us to see our data remotely, make adjustments and have good visibility as to where all of the pressure controllers are in the system”



Graham Hollier
Network Pressure Adviser
Severn Trent



Case Study: Eskişehir Water turns to HWM to reduce pressure-based leakage

saving 30,461m³ of water per month and increasing the lifespan of the pipes in their network

The Challenge

With responsibility for providing water services to the 800,000+ residents of Eskişehir, Turkey, it is important that **ESKI** has visibility and control of its network.

Recently, ESKI was experiencing issues with pipe bursts and turned to TEKSU, the authorised distributor of HWM products in Turkey, for help.

The Solution

Because ESKI was supplying more water into the network than was being taken out by the residents of Eskişehir, pipes were experiencing a build up of pressure which was causing them to burst.

To solve this issue, TEKSU recommended **Pegasus+**, our sophisticated and highly versatile pressure control system.

Through Pegasus+, ESKI is able to monitor the pressure at critical points in the network, and where necessary, reduce or increase pressure remotely.

ESKI installed 30 Pegasus+ systems at problem areas within their network, as well as 50 Multilog data loggers (to monitor flow).

As a result, ESKI is able to supply sufficient pressure to the network according to demand and has seen pressure-related pipe bursts decrease.

In fact, ESKI estimates that annually they are saving 1,857,336 m³ of water (**£261,000**) through effective pressure management.



TEKSU

Customer

TEKSU
Eskişehir Water

Industry



CLEAN WATER

Product

Pegasus+



Application

- Pressure Monitoring



Sentinel 2

Advanced Pressure Controller

Sentinel 2: LTE-M & NBloT-enabled two-point controller

Sentinel 2 is an effective two-point controller which, through the inclusion of our innovative modem (capable of connecting via LTE-M, NBloT, 4G, 3G and 2G) benefits from the latest data logging and telemetry capability to deliver full data reporting and the ability to change settings remotely.

Sentinel 2 switches between high/low pressure, by time or flow, to provide effective pressure optimisation when demand changes.



Key Features and Benefits

- NBloT /LTE-M based cellular communication as standard with fallback 2G capability
- two-point control switching HI/LO on time or flow, with full telemetry and remote control
- one output channel for controlling a latching type pilot solenoid or electrical relay
- hydraulic circuit is designed to avoid the main PRV from closing completely or permitting extra pressure
- fully waterproof with an IP68 rating that has been tested at 10m over a 24 hour period



Time-Based PRV Control

Sentinel 2 is ideal for controlling a PRV to reduce pressure at night, thereby minimising leakage and reducing the risk of pipe bursts during low usage periods.

A flow meter is not essential for this time-based control technique.

Flow-Based PRV Control

Sentinel 2 can be used with a Flow input which can be used separately, or to override the time-based control when unexpected demands are detected by the Flow meter.

Data Logging w/ Alarms

Sentinel 2 can log both upstream and downstream pressures in addition to Flow (similar to triple input Multilog).

Advanced telemetry can be used for alarms or to change the Solenoid state from the office.

Pressure Transient

Transient Data Logger

Pressure Transient: effective network transient logging

Featuring advanced cellular telemetry and an innovative 'event window selection' the operator can now send transient alarm information and a selectable window of fast logged data before and after the event, or for set time-based windows.

Transient logging can now be part of permanent network monitoring for standard flow and pressure logging.



Key Features and Benefits

- fast logging capability, up to 100 times per second, ideal for transient monitoring changes
- event window selection to select data around transient for transmission
- NBloT LTE-based cellular communication standard with fallback 2G capability
- 4GB internal flash memory enables up to 2 billion readings
- fully waterproof with an IP68 rating that has been tested at 10m over a 24 hour period

Transducer

External Pressure Transient Transducer

The Pressure Transient Transducer is an industrial pressure transmitter with a Piezo-resistant ceramic pressure sensor.

The construction gives it excellent media compatibility with a stainless steel housing, and sealing O ring to ensure the product is suitable for a wide range of applications.

Every device is temperature compensated and calibrated and supplied with a traceable serial number and calibration certificate.



Data Logging

Data is critical in the monitoring of clean water networks.

Accessibility to accurate data is key in ensuring the continued effectiveness of the network. Data loggers collect, store and can use advanced cellular telemetry to deliver, the data used to make key decisions.

As such, they must be robust and dependable.

We design and manufacture a wide range of market-leading data loggers that includes:



Multilog LX2



Multilog 2



COMlog 2



LoLog

Multilog LX2

LTE-M & NBloT-enabled Data Logger

Multilog LX2: highly-versatile, battery powered data logger

Multilog LX2 is the highly versatile, battery powered telemetry data logger incorporating a convenient serial input that supports compatibility with a wide variety of sensors and meters, including Modbus.

A powerful, fast logging solution, Multilog LX2 delivers effective data recording and efficient transmission.



Key Features and Benefits

- pulse interval timing smooths reading set times of infrequent pulses e.g. minimum night flow
- up to 2x digital flow inputs and 1x analogue input (internal or external pressure, 4-20mA)
- NBloT LTE-based cellular communication standard with fallback 2G capability
- fully waterproof with an IP68 rating that has been tested at 10m over a 24 hour period
- true max and min flow and investigation of pressure spikes through Pseudo logging
- 5 year battery life (depending on settings and signal strength)
- serial input for connection to digital meters, SonicSens 3 level sensor, Permalog+ leak noise logger and Modbus sensors

Incident Logger Data Logging System

Incident Logger is a data collection system for incidences where large amounts of data are required in a short space of time

Using a GPS module, Incident Logger can be rapidly deployed without software or PC cables, generating site specific data in moments and allowing for targeted work in the affected area.

- in-built GPS module generates location data
- real-time alarms can be enabled for immediate response
- up to 2x digital flow inputs and 1x analogue input



Case Study: HWM delivers bespoke pressure and leak noise monitoring solution

to world's largest manufacturer of Methylene Diisocyanate

The Challenge

When Wanhua Chemical required both pressure and leak noise monitoring for their water network, they turned to HWM for a bespoke solution.

Approaching us with a unique set of requirements, Wanhua Chemical needed accurate monitoring of both the pressure within their water network and leak noise to identify leaking pipes.

The Solution

To be able to meet these specific requirements we combined our Multilog LX2 data logger with a Hydrophone Sensor. The Hydrophone is able to monitor both pressure and leak noise, while the Multilog LX2 records the data and used both 3G and GPRS transmission to provide Wanhua Chemical with the recorded information.

Wanhua Chemical is the first company to use the combination of the Multilog LX2 and a Hydrophone to monitor both pressure and leak noise.

The successful installation of 42 loggers allows Wanhua Chemical to completely monitor the water network at one of their main manufacturing sites. Throughout the trial and installation process, HWM has offered regular support to Wanhua Chemical, including weekly meetings to discuss the status of the project.

HWM has also been able to support in the choosing of locations within the network for the loggers to be installed. One logger was found to be picking up external noise after installation and this was resulting in false leak readings. The support meetings between HWM and Wanhua Chemical helped to resolve this issue swiftly and effectively.

With our ongoing support, Wanhua Chemical will continue to successfully monitor their water network using the innovative combination of the Multilog LX2 and the Hydrophone Sensor.



Customer
Wanhua Chemical



Product
Multilog LX2



Application
- Data Logging
- Leak Detection

Multilog 2

LTE-M & NBloT-enabled Multi-Channel Data Logger

Multilog 2: highly-advanced, multi-channel data logger

Multilog 2 is the highly versatile, multi-channel data logger designed to monitor any combination of digital and analogue signals.

Multilog 2 contains our advanced modem which is capable of connecting via LTE-M or NBloT (with 2G fallback) and is available with support for WITS 1.3, delivering direct integration with WITA SCADA systems.



Key Features and Benefits

- NBloT LTE-based cellular communication standard with fallback 2G capability
- 4 channel logging with 8 and 16 channels available on request
- primary logging to 1 second as standard - 25Hz for transient events
- fully waterproof with an IP68 rating that has been tested at 10m over a 24 hour period
- support for WITS 1.3, delivering direct integration with WITS SCADA systems
- 5 year battery life (depending on settings and signal strength)
- serial input for connection to digital meters, SonicSens 3 level sensor, Modbus, SDI12, RS232, Badger/Sensus/Neptune serial meter interfaces

Multilog 2 provides bespoke electricity monitoring solution

During heavy rainfall events in Skopje, flood waters were risking damage to the city's water pumps and PE Water Supply needed a solution to monitor the electricity supply to the pumps.

Multilog 2 was installed to constantly measure the electricity current and voltage to the pumps, providing PE Water Supply with the ability to check that pumps were powered and operating correctly in flood events.



Data Logging Products



Multilog LX2

Multilog LX2 is a battery powered data logger that incorporates a serial input supports compatibility with a wide variety of sensors and meters, including Modbus.

LTE-M and NBloT-enabled, Multilog LX2 delivers effective data recording and transmission.



Multilog 2

Multilog 2 is the highly advanced and versatile multi-channel data logger designed to monitor any combination of digital and analogue signals.

Multilog 2 is ideal for a variety of specialised applications, including monitoring PRV flow and pressure.



COMlog 2

COMlog 2 is the highly versatile data logger designed to be a cost-effective, multi-application data logging solution.

Perfect for AMR monitoring, COMlog 2 is compatible with any sensor or meter that has a volt-free, pulsed output.



LoLog 450

LoLog 450 is a flexible data logger.

Completely waterproof, battery powered and submersible, it is designed for portable use and can be supplied in single or dual channel variants. The analogue channel can be used for internal pressure and external pressure.



LoLog-R

LoLog-R is a high specification data logger which incorporates Pulse Interval Timing to help establish accurate recording of minimum flow.

As a compact and battery powered radio 'drive by' logger, it is designed for portable use.



LoLog Vista

LoLog Vista is a simple, highly flexible data logger. Featuring a convenient display screen and designed for portable use, it can be applied to most data logging applications in minutes.

LoLog Vista operates unattended until a user collects the data.

Fire Supply Monitoring

Leaks in infrequently used water networks, such as fire supplies, can be costly when undiscovered.

In partnership with Invenio Systems, we have developed the Flow.Watch flow monitoring system by combining advanced temperature analysis with our versatile telemetry technology.

flow•watch

Fire Supply Surveillance

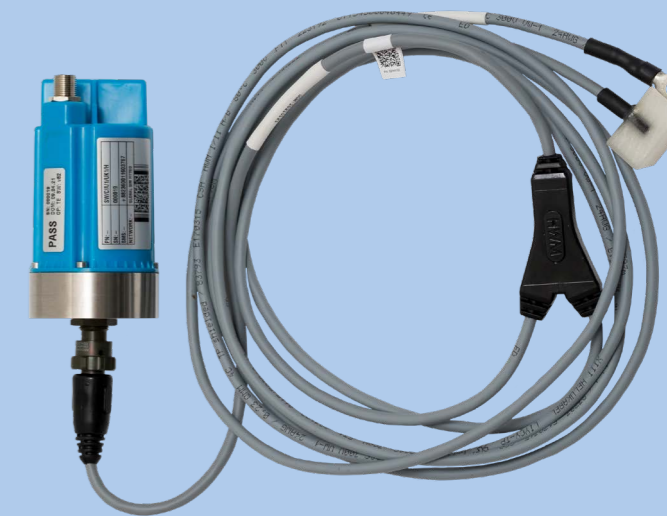
invenio
systems

Flow.Watch: fire supply flow monitoring system

Flow.Watch is a unique solution that combines advanced temperature analysis with versatile telemetry technology to deliver economical fire supply flow monitoring.

Flow.Watch identifies and categorises fire supply flow into leakage, test use and intermittent use.

The system can also be used to detect water being used illegally, to monitor vacant properties and to confirm customer usage when no meter is present.



Key Features and Benefits

- capable of detecting almost any flow through the fire supply
- enables rapid resolution of customer-side losses on unmetered services
- suitable for public supply fire hydrants and private fire supply systems
- continual analysis of flow and/or leaks
- cheaper, non-restrictive metering alternative
- detects fire supply back-siphonage before water quality is affected
- detected flow can be categorised into leakage, illegal use or fire tests
- NBIoT LTE-based cellular communication standard with fallback 2G capability

Case Study



When assessing the extent of water use in the fire mains systems of some of Severn Trent's large industrial facilities, Invenio monitored 118 industrial fire supplies over 8 weeks.

Of these sites, 36 were found to have regular water usage events drawing from the unmetered fire supply (30.5%). In addition, 35 were found to have some form of leakage (30%) and testing was recorded in 16 sites (14%).

Flow testing in the fire supply of one property discovered usage of 375 litres/minute. With weekly tests on average lasting 38 minutes, Invenio estimated up to 229,800 litres/week of usage from fire supply testing alone.



Water Quality Monitoring

When delivering clean water it is critical to ensure water of the highest quality.

By combining our advanced Multilog 2 telemetry data logger with ATI's pioneering multi-parameter system we have developed a smart digital solution for water quality monitoring.



MetriNet

Water Quality Monitoring System



MetriNet: pioneering real-time water quality monitoring

MetriNet combines the market leading Multilog 2 telemetry logger with ATI's pioneering multi-parameter system to deliver real-time water quality data.

MetriNet uses a series of smart digital sensors to continually measure a range of water quality parameters including residual chlorine, turbidity, pH, conductivity, dissolved oxygen temperature and more.



Key Features and Benefits

- interchangeable M-nodes means wide variety of water quality parameters available
- NBloT LTE-based cellular communication standard with fallback 2G capability
- can be used in closed bypass arrangement to completely eliminate water loss
- 4 channel logging with 8 and 16 channels available on request
- primary logging to 1 second as standard - 25Hz for transient events
- M-nodes run autonomously for years on small batteries
- user-selectable multiple sample rates to minimise power consumption
- fully waterproof with an IP68 rating that has been tested at 10m over a 24 hour period

Interchangeable M-nodes

MetriNet uses a series of smart digital sensors (M-nodes) to continually measure a range of water quality parameters. M-nodes are connected to the water supply using a purpose designed flow cell arrangement and can operate up to pressures 6 bar.

Currently the following water quality parameters can be measured:

- free chlorine
- total chlorine
- pH
- turbidity
- conductivity
- ORP
- fluoride
- dissolved oxygen
- dissolved ozone
- chlorine dioxide
- peracetic acid
- hydrogen peroxide

Applications and Software

To deliver effective results, HWM products are supported by a variety of applications and software solutions.

Each of the bespoke apps and software solutions that supports our products is designed and programmed in-house by our dedicated team.

We have developed various applications and software solutions to support our range of loggers and sensors, including:



DataGate

DataGate is our online data server that provides fast, convenient and secure remote data management.

Through a variety of methods (FTP, VMN, modem etc.), DataGate has the capability to receive data from all mobile networks and processes over 1.7 million messages a day.



IDT

IDT is an installation and diagnostic app that both supports quick and reliable deployment and the on-site programming and updates of HWM Bluetooth® enabled loggers.

IDT can also be used to download data from deployed loggers.

Applications and Software Products



PressView

PressView is a web-based dedicated platform for managing Pegasus+ and Sentinel 2 pressure controllers.

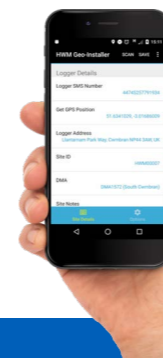
PressView delivers zonal pressure management operations and self-learning closed loop control through a 'fleet' mapping view.



PermaNET Web

PermaNETWeb is a digital platform created to gather, collate and easily display the leak noise data collected by PermaNET devices.

PermaNET Web is secure, easy to use and available on any internet-enabled device.



Deployment App

The HWM Deployment App is an installation tool that supports the quick and effective deployment of HWM manufactured data loggers.

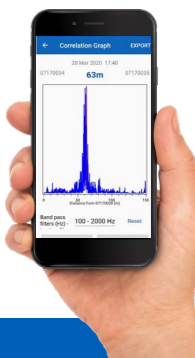
Using the app, installation simply becomes activating the unit, scanning the barcode and fitting the unit within the network.



DXmic Pro App

The DXmic Pro app is a mobile application developed to simplify the process of data retrieval from DXmic Pro devices.

Through the app, DXmic users can immediately share downloaded audio files and site reports via e-mail or through DataGate.



WebCorr

WebCorr is a mobile application that delivers rapid in-field correlation of data collected by PCorr+ data loggers.

Using wireless connectivity to retrieve data, WebCorr can quickly provide correlation of leak noise for effective leak location.

Antenna Options

2G/3G/4G/NB-IoT/LTE-M (Cat-M1)⁺ Antenna

Signal strength within the cellular network can vary dramatically even within the same cell proximity to the transceiver.

The type of antenna, position and angular orientation of the antenna each has a significant effect on the ability of a device to reliably communicate with the cellular network.

To ensure reliable 2G/3G/4G/NB-IoT/LTE-M (Cat-M1) data communications, it is essential that the most suitable antenna is selected and mounted in the most appropriate location.

T-Bar

Frequency Range	698~960/1710~2655MHz
Dimensions	115 x 16.2 x 0.8mm
Operating Temp.	-40°C - +50°C
Mounting Method	Adhesive



I-Bar

Frequency Range	698~960/1710~2655 MHz
Dimensions	26 x 125 x 7mm
Operating Temp.	-40°C - +85°C
Mounting Method	Adhesive



Button

Frequency Range	850/863/900/1800/1900/2100 MHz
Dimensions	115 x 16.2 x 0.8mm
Operating Temp.	-40°C - +85°C
Mounting Method	Bolted

*Contact HWM to confirm worldwide coverage of NB-IoT and LTE-M (Cat-M1)



Dipole

Frequency Range	850/900/1700/1800/1900/2100MHz
Dimensions	160 x 45 mm
Operating Temp.	-20°C - +60°C
Mounting Method	Magnetic

*Contact HWM to confirm worldwide coverage of NB-IoT and LTE-M (Cat-M1)



Hanging Antenna

Frequency Range	700~2700MHz
Dimensions	61 x Ø33 mm
Operating Temp.	-40°C - +85°C
Mounting Method	Magnetic



Magmount

Frequency Range	700/850/900/1700/1800/1900/2100MHz
Dimensions	280 x Ø50 mm
Operating Temp.	-40°C ~ +85°C
Mounting Method	Magnetic

*Contact HWM to confirm worldwide coverage of NB-IoT and LTE-M (Cat-M1)



Dome

Frequency Range	890~960/1710~1880 MHz
Dimensions	104 x Ø32 mm
Operating Temp.	-40°C - +80°C
Mounting Method	Bolted

*Contact HWM to confirm worldwide coverage of NB-IoT and LTE-M (Cat-M1)



Magpot

Frequency Range	698-960/1710-2655MHz
Dimensions	61 x Ø33 mm
Operating Temp.	-40°C ~ +85°C
Mounting Method	Magnetic

*Contact HWM to confirm worldwide coverage of NB-IoT and LTE-M (Cat-M1)



We are experienced and respected manufacturers of monitoring and telemetry equipment for water, wastewater and gas networks, together with telemetry AMR and facilities optimisation products.



Clean Water Network Monitoring

With over 30 years in the water industry, HWM is skilled at addressing the challenges of water network monitoring. With increased pressure on water globally, we can solve the problems of effective water network management, providing data on performance and enabling effective network management.

Waste Water Network Monitoring

Control of waste water networks is a key public health challenge. Effective monitoring of waste water networks reduces both frequency and impact of pollution events. Permanent installation of remote monitoring equipment helps to alert network operators to immediate problem sites.

Gas Network Monitoring

Effective monitoring of gas networks has traditionally been a challenge, due to a lack of on-site power and deployment difficulty. Our gas products address these concerns, using our expertise in ATEX and low power design capabilities. This enables users to collect data about this critical infrastructure.

Automated Meter Reading

Accurate and consistent data is the foundation for effectively controlling energy usage and reducing waste. AMR delivers precise and timely consumption data for investigation and analysis of energy usage as well as exact billing.

Facilities Management

HWM has pioneered the development of wireless monitoring solutions for fixed network deployment. These can be combined with a variety of sensors, providing our partners with 'near real-time' data that they need to help their customers to eliminate waste, cut costs and reduce carbon emissions.



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MONITORING ASSETS, DELIVERING DATA, BRINGING CONTROL

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