

Improving flowmeter performance with WITS technology

How the AquaMaster 3 with WITS can transform the way you manage your water network

Get more value from your data and cut your maintenance costs using the AquaMaster 3 with WITS

Measurement made easy



Introduction

With the emphasis in the UK water industry on whole life costing, there is a growing need to understand as much as possible both about the performance of a water network and the equipment installed in it.

Where flow measurement is concerned, ongoing developments in electromagnetic flowmetering technology are opening up new possibilities for understanding performance both at pipeline and device level.

With thousands of flowmeters likely to be installed in any given network, it is important to be able to ensure that each device is working effectively. In many cases, the installed meter stock will be comprised of a mixture of measurement technologies of varying types, ages and accuracies, each with their own specific maintenance regimes. The challenges involved in managing these meters can add substantially to their total life cost. Moreover, the inability of many meters to provide accurate measurement can result in lost profits caused by leakage and inaccurate billing of customers.

The application

Being able to match finite supplies of water against ever rising demand efficiently and cost effectively is a challenge facing every water operator.

The energy and cost expended in producing clean water means it is vital that as much of it as possible reaches its destination and that users are correctly charged according to their exact consumption. Despite this, billions of cubic meters of water are being lost from networks worldwide each year.

The ability to accurately trace and quantify lost water is a vital part of any water management strategy. Achieving this calls for measurement devices that are reliable and precise and that are suitable for use across the diverse types of environment typical in most water distribution networks.

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The challenge

Despite recent advances in measurement technology, many of the flowmetering technologies currently in use in water distribution networks still lack either the accuracy or the reliability needed for effective water management.

Mechanical meters in particular continue to be used in large numbers. Whilst they may be cheap to purchase, they offer limited accuracy and an increased risk of failure caused by wearing of their mechanical components. As a result, they require frequent maintenance, with many needing to be replaced within just a few years of installation. In many cases, the cost of maintaining, removing and replacing a meter, together with loss of revenue caused by inaccurate measurement, can eclipse any savings achieved at the purchase stage.

Furthermore, many of the flowmeters currently being used offer limited possibilities for relaying data to a centralised control or monitoring system, requiring operators to send engineers to site to collect readings and / or carry out maintenance inspections. This can be particularly costly where meters are situated in remote or hard to reach locations.

These problems are now being addressed by the latest generation of electromagnetic flowmeters, such as ABB's AquaMaster 3. Compared to other flowmeter types, the AquaMaster 3 offers greatly enhanced accuracy and repeatability throughout its operational life, with uncertainty of $\pm 1\%$ reading or better. With no moving parts, it eliminates problems with wear and tear, minimizing maintenance, and require no upstream strainers to filter sediment.

Added to these benefits is a range of augmented features, that make the AquaMaster 3 the ideal choice for any operator looking for a low-maintenance, high accuracy measurement solution.

Now featuring WITS technology, the AquaMaster 3 offers operators true anytime any place access to near real time data on flow and pressure, together with a raft of device-level operational and maintenance data.

The solution

Offering access to a raft of operational and maintenance data, including advanced diagnostics, ABB's AquaMaster 3 with Water Industry Telemetry Standard (WITS) DNP3 based open protocol promises to completely transform the way that water network operators manage their assets.



Fig. 1: The AquaMaster 3 with WITS DNP3 enables remote access to a wide range of operating and diagnostics data.

Based on tried and tested network technology originally designed for process automation in electrical utility applications, WITS DNP3 enables communication between different types of data acquisition and control equipment.

The first ever flowmeter to feature integrated WITS technology and the option of combined flow and pressure measurement in a single instrument, the AquaMaster 3 opens up new possibilities for monitoring water network performance.

High speed, high resolution data logged by the flowmeter can be downloaded to provide detailed information on any network anomalies in conjunction with detection methods such as step testing, burst / pressure transients or nightline monitoring.

All data on specific events is time-stamped, with metadata tags providing detailed information about measured data and events, including details about the moments leading up to the event. Where a critical event occurs, reports are immediately generated and sent to enable quick action to be taken.

AquaMaster 3 supports WITS advanced alarm profile functionality, enabling users to set different alarm limits depending on the time of day and day of the week. This powerful feature enables tight alarm limits to be set on nightline flows, whilst supporting peak morning and evening draws. Separate profiles can be configured for weekdays and weekends.”

This same level of intelligence also extends to the AquaMaster 3 itself. DNP3 enables remote access to a wide range of data including diagnostics and configuration changes. Any problems such as power management issues, sensor coil damage or damage to the sensor cable caused by third parties can be quickly identified, together with the time those issues occurred and the exact location of the affected device.

In this way, the need for engineers to physically visit devices is eliminated. Instead, users will be able to use the diagnostic data to ensure that engineers are only deployed when and where necessary.

Further maintenance savings can also be achieved by the AquaMaster 3's over-the-air programming feature. This enables the flowmeter transmitter to be remotely upgraded, enabling new versions of software to be uploaded without having to visit the unit.

The inclusion of WITS is just one of a long list of features that have made the AquaMaster 3 one of the leading flowmeters for use in water distribution networks throughout the UK. Other features include a choice of mains, battery and renewable power options, with the flowmeter able to draw power from either solar or wind-powered energy sources.



Fig. 2: WITS is the latest in a line of innovations that have made the AquaMaster 3 a leading choice for use in water distribution networks.

Installing the AquaMaster 3 is made simple by its use of ABB's 'fit and flow' intelligent installation technology. With this technology, all aspects of an installation are stored within the sensor, including the site settings, calibration factors and any serial numbers usually required during installation, maintenance or replacement. When connected to a transmitter, all of this information is automatically uploaded from the sensor, greatly simplifying the installation and commissioning process.

As a further assurance of a robust metering regime and lifelong accuracy, ABB also offers users its CalMaster2 in-situ verification service for the AquaMaster 3. Performed by an ABB service engineer, this service verifies a meter's current operational status and also predicts any potential future faults. Users are issued with traditional calibration verification certificate complete with an uncertainty statement.

For more information about the AquaMaster 3 with WITS, email moreinstrumentation@gb.abb.com or call 0870 600 6122 ref: 'AquaMaster 3 WITS'.

Contact us

ABB Limited
Process Automation
Oldends Lane
Stonehouse
Gloucestershire GL10 3TA
UK
Tel: +44 (0)1453 826661
Fax: +44 (0)1453 829671

ABB Inc.
Process Automation
125 E. County Line Road
Warminster
PA 18974
USA
Tel: +1 215 674 6000
Fax: +1 215 674 7183

www.abb.com

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