

AquaMaster

Issue 01

User's Newsletter

Welcome to the first edition of the AquaMaster Users' newsletter, providing information on the latest news and developments affecting ABB's AquaMaster range.

The launch of the AquaMaster electromagnetic flowmeter in 2001 marked a new era in water metering technology. Offering high accuracy and performance, together with a low cost of ownership compared to conventional mechanical meters, the AquaMaster promised to transform the face of water and revenue management. Now, two years on, this potential is being realised by users of the thousands of AquaMaster units shipped to locations around the world, which are helping to achieve vast improvements in the way in which water is metered and managed.

We will be using this newsletter to keep you up to date on the latest developments concerning the AquaMaster. As well as information on the latest new product features, the newsletter will feature examples of how AquaMasters are being used around the world, together with advice on how the AquaMaster can be used to help maximise the efficiency of your water management network.

We hope you will find this newsletter useful. Further information on any of the points covered in this newsletter can be obtained by sending an email to paul.wade@gb.abb.com.

AquaMaster gets GSM option

A GSM option is now available for the AquaMaster offering remote access to up-to-date flow data. Comprising integral GSM communications technology, the new module makes it possible to request and receive a variety of information from any location simply using a mobile phone, eliminating the need for regular site visits.

The new GSM option enables details on a variety of parameters, such as meter readings, battery status, alarms and flowrate, to be obtained via a mobile telephone as an SMS text message either on demand or automatically at pre-set intervals.

Using simple commercially available SMS Gateway solutions, the automated SMS meter readings can also be received,

decoded and exported to an existing billing application or database to provide real-time usage information.

In addition, users can now remotely configure their AquaMaster flowmeters just by sending an SMS message with the specific parameters they want to change.

The GSM option is available for both the mains and battery powered versions of the AquaMaster. When the unit is powered from an AC supply, the GSM module is constantly powered.

To conserve energy, the battery powered AquaMaster uses its display unit's internal clock/calendar to control a programmed schedule, which ensures that the GSM module is only operational at certain times.



To see an example of the data currently available via GSM you can now dial into ABB's demonstration AquaMaster unit at our Stonehouse factory.

To upload a data sample from the unit, simply send the following text message to +44 (0)7720 409560: +setup;flw;tof;alm;

A down to earth guide to grounding

'Grounding' or 'potential equalisation' is an important part of the AquaMaster installation process and plays a major role in ensuring optimum flow measurement accuracy. But what is it and why is it necessary?

The AquaMaster works on Faraday's principle, which states that the electromagnetic force (EMF) generated by a conductor moving through a magnetic field is proportional to the length of the conductor and the speed at which it moves.

In a water metering application, problems can occur with excess 'noise' created by conductive electrochemical substances such as salts and minerals present in the water. These substances can react with each other to create fluctuating charges of between one and two volts dc. These charges cannot be ignored since they are many times greater than the signal voltage generated by the sensor and required by the flow computer.

The solution to this problem is to get the body of the flowmeter into contact with the fluid. However, this is not possible due to the insulation liner (rubber) construction of the inside of the flowmeter. Instead, fluid contact rings are used to make contact

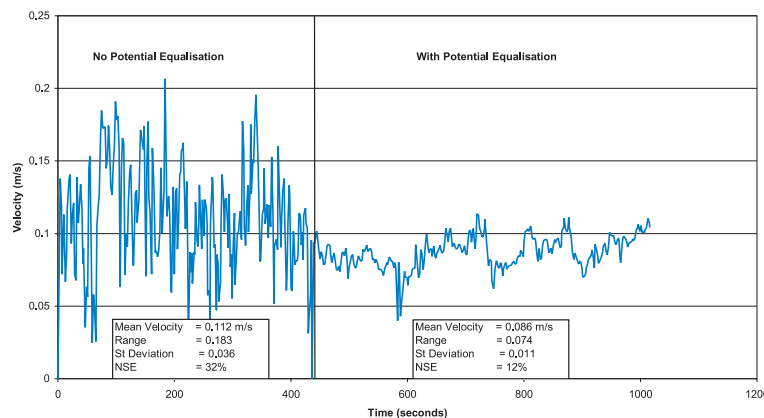
with the fluid and produce a signal which can then be used to calculate the flowrate. The AquaMaster eliminates the effects of electrical noise caused by the residual charges within the water by assigning them with a 'zero' potential value. Anything above that value is then taken as the actual flow reading, ensuring accurate measurement of the flow rate.

A Best Practice Guide will shortly be available from ABB explaining how to correctly carry out the potential equalisation process when installing the AquaMaster.

Some simple do's and don'ts for grounding:

- Do make good connections between the contact ring and the flange of the flowmeter (a stainless steel braid is provided for this purpose)
- Don't connect the flowmeter to a Ground Spike
- Do connect the fluid contact ring to the adjacent pipework either side if it is metal,
- Don't connect it to an adjustable flange coupling, (they are insulated by rubber)

Graph demonstrating flowmeter signal performance before and after fitting potential equalisation



New contractor training course

ABB has introduced a training certification course aimed at contractors responsible for the installation of AquaMaster electromagnetic flowmeters.

With a large number of



AquaMaster units now being installed by contractors, ABB has launched the course to enable AquaMaster customers to ensure that their units are being fitted and commissioned only by trained contractors.

The one day course costs £250 and covers all aspects of installing and commissioning the AquaMaster, with a certificate being awarded to attendees on completion.

"Our aim is to introduce a single official standard for the installation of AquaMaster flowmeters which contractors must adhere to and which our customers can rely on as proof of competence," says Brian Hayes, Flow Business Manager, ABB.

To register for a place on the course, send an email entitled 'Contractor Training Course' to bryan.franklin@gb.abb.com.

How do you select yours?

Flowmetering in the water industry has long been characterised by the use of traditional mechanical meters. Simple to operate and with a low price tag, these meters are commonly seen as an attractive flowmetering option.

There are, however, a number of factors which will affect the long-term efficiency of a mechanical meter.

Firstly, it will only be truly accurate on the first day of installation. After that, its accuracy will steadily deteriorate, due to the inevitable wearing of the mechanical components. Whilst a loss of accuracy of a few percentage points may appear insignificant, the potential loss of revenue this represents is becoming increasingly important in addressing areas for boosting profitability and levels of service. A second consideration is the total cost of ownership.

ABB flowmeter calibration certified better than ever by UKAS



ABB now has official proof of the high accuracy of its flowmeters following a recent visit by the United Kingdom Accreditation Service (UKAS).

A surveillance visit by UKAS of ABB's flow calibration facilities at its Stonehouse factory in Gloucestershire has resulted in ABB being certified as the only company in the UK with a calibration rig accurate to within an expanded uncertainty of $\pm 0.027\%$.

ABB uses a process known as 'wet

calibration' to test flowmeters under good flow conditions on its flow rigs. The resulting digital data is then used to show that the flowmeter has been calibrated for accurate measurement within the limits of its specification.

ABB's Stonehouse calibration rigs are used to test flowmeters between 6mm and 2.4 metres in diameter.

The rigs are used to obtain the accuracy of each flowmeter by comparing its measurement performance against a

known value provided by a reference device such as a weigh tank, volume tank or meter prover. Any deviations from this value are then used to calculate the fundamental accuracy error value for the flowmeter.

ABB operates two flow rigs at its Stonehouse site, supplied by a one million litre underground tank. The rigs can be used to test virtually every type of flowmeter at flow rates from one millilitre to 2,700 litres per second.

The United Kingdom Accreditation Service is the sole national accreditation body recognised by government to assess, against internationally agreed standards, organisations that provide certification, testing, inspection and calibration services. Although ABB has had UKAS accreditation since 1982, this is the first time that it has been able to claim such a high accuracy for its calibration facilities.

"ABB spends considerable time and money constantly improving the accuracy of its flow equipment in order to keep up with customer demands," says Steve Dickson, Deputy Head of the Flow Calibration Laboratory. "Even though our flow calibration rig sets a global standard for accuracy, we will continue to strive for even better performance."

This includes everything from installation through to maintenance, plus the cost of manually collecting information from several meters at a time.

An added factor is the pressure being applied by OFWAT to identify and address leakages throughout water supply networks. In many cases, this is driving the adoption of new technologies enabling more accurate monitoring and featuring additional capabilities which enable leaks and other problems to be immediately traced and rectified.

In most cases, payback on the installation of an electronic flowmeter could be achieved within days. Let's assume that we have a mechanical 6" flowmeter that is accurate to $\pm 2\%$. This flowmeter is installed in a line with an average flow rate of 25 litres per second, which equates to an annual usage of 788,400m³. Assuming a cost just for water at 70 pence per m³, over the course of one year, the inaccuracy of the meter would be losing the operator around £9,600.00 of revenue.

Now let's assume that we replace this meter with an ABB AquaMaster electromagnetic meter, which has an accuracy of $\pm 0.5\%$. Based on the same flow conditions and water cost, the meter will pay for itself within just 23 days.

"In most cases, payback on the installation of an electronic flowmeter could actually be achieved in a matter of days."

With no mechanical moving parts, electronic meters offer constant accuracy and eliminate the cost, time and disruption associated with replacing worn parts.

In short, electronic flowmeters will rarely represent the lowest cost solution at the initial purchasing stage. If long term cost savings are your aim, however, then opting for electronic flowmeters can prove by far the wisest decision.



What's special about the AquaMaster?



ABB's AquaMaster electromagnetic flowmeter represents the latest in electronic flow meter technology, making it

a highly sophisticated tool for water resource management. With the ability to deliver accurate measurement across a very wide range of flow rate sensitivities, including extremely low flow, the AquaMaster is suitable for a much wider range of applications than existing electromagnetic flow meters.

Furthermore, when compared to traditional mechanical meters, AquaMaster electromagnetic flowmeters offer consistently high performance, coupled with greatly enhanced reliability and reduced maintenance. Unlike mechanical meters, the AquaMaster's accuracy also remains constant, enabling them to provide precise flow measurement throughout their service life. With no mechanical moving parts which can wear out, the AquaMaster can offer true fit and

forget operation and can eliminate the disruption associated with keeping mechanical meters in good working order.

The accuracy and flow measurement capabilities of AquaMaster open the way for use in new revenue management applications, such as:

- Bulk revenue
- Distribution
- Network analysis
- Leakage tracing
- Irrigation
- Abstraction

The meter's reliability and low maintenance can also help to substantially reduce the total cost of ownership compared to traditional meters.

AquaMaster v. Traditional meters - a comparison

AquaMaster	Traditional meters
<p><u>ADVANTAGES</u></p> <ul style="list-style-type: none"> ● No moving parts eliminates the need for routine maintenance ● Reduced overall flow system cost - e.g. no isolating valves need to be installed for maintenance ● No filters required ● Flow reading will always be accurate - will not be affected by wear ● Capable of logging flow and pressure information ● Logged information can now be retrieved remotely via GSM ● If installed properly, AquaMaster meters can offer fit-and-forget operation for up to 10 years ● Payback can typically be achieved within one month ● Reduced straight lengths required <p><u>DISADVANTAGES</u></p> <ul style="list-style-type: none"> ● Higher initial purchase price ● Requires installation by approved installer 	<p><u>ADVANTAGES</u></p> <ul style="list-style-type: none"> ● Lower initial purchase price <p><u>DISADVANTAGES</u></p> <ul style="list-style-type: none"> ● Frequent routine maintenance is required - e.g. to change filter inserts ● Maintenance requires purchase of isolating valves to shut off flow ● Reading accuracy is affected by mechanical deterioration - true accuracy will only ever be achieved in the first days of operation ● Typical lifespan of five years ● Need to install two meters in parallel for widest possible turndown ● Increased straight lengths required for correct installation and accuracy

Get the best from your AquaMaster

ABB is offering a series of Best Practice Guides demonstrating how to get the best performance from your AquaMaster. Available in pdf format, Best Practice Guides are currently available covering the recommended battery changing procedure for all versions of the battery powered AquaMaster. A new Best Practice Guide will

also shortly be available covering the procedure for 'grounding' (see page two of this newsletter) when installing AquaMaster flowmeters.

To register to receive copies of the Best Practice Guides, please send an email with the subject line 'Best Practice Guides' to paul.wade@gb.abb.com.

