

Accessing flow data in remote locations

Using ABB's AquaMaster for remote metering applications



Immediate access to flow data in remote locations for improved water network management decision-making

Measurement made easy

Using ABB's AquaMaster for remote metering applications

Introduction

Developments in flowmetering technology are being driven by the need to derive maximum intelligence from as much of the water network as possible. Water companies now increasingly demand and expect a wider range of data that can help them to more effectively manage their water networks. Where this may be relatively straightforward to achieve in urban areas, it can be less easy where flowmeters are located in remote or hard to reach locations.

Advances in power technology have given users the option of installing flowmeters even in areas where no mains power is available. Today, meters are available with battery and even renewable power options. This independence is now being further reinforced by the availability of an extended range of remote communications technologies.

The application

Water companies face many potential problems in optimizing network efficiency. Of these, significant challenges include ensuring a consistent supply pressure, being able to more accurately measure the underlying rate of leakage and identifying potential problems including pressure surges and apparent demand spikes before they can escalate.

Being able to assess actual pipeline conditions by extracting real-time operational data from installed instruments such as flowmeters is therefore of paramount importance. There are various ways in which this can be done. Options available today include SCADA, remotely accessible PLCs, dataloggers and GSM/GPRS.

The challenge

In choosing the best option for an installation, there are various factors to consider, including cost, practicality, security and ease of use. Where dataloggers are concerned, there is also the issue of location, particularly where a flowmeter is installed in a remote or hard to reach location. Here, potential cost and time is often incurred as an engineer must be deployed to either download the data or retrieve the entire datalogger.

A solution

This procedure is increasingly being replaced by radio-based remote retrieval techniques.

ABB's AquaMaster 3 electromagnetic flowmeters include GSM-SMS radio technology, enabling up-to-date information to be remotely collected from anywhere around the world. Providing immediate access to a host of flow data, GSM-enabled AquaMasters eliminate the time, cost and potential errors traditionally associated with the manual collection of flowmeter information.

Using the same technology as a mobile telephone, the AquaMaster can be contacted using a PC or laptop or through a mobile telephone via SMS messaging.

Via a GSM link to their PC or laptop, users can gain full access to the AquaMaster's three integral data loggers, two of which collect data on flow and pressure, with the third providing daily flow totalization. Data can be downloaded from the flow and pressure loggers, based on both a 15 minute and a high resolution one minute sample rate, to provide a range of information which can be used to pinpoint supply fluctuations and identify potential problems vital to water company leakage teams.

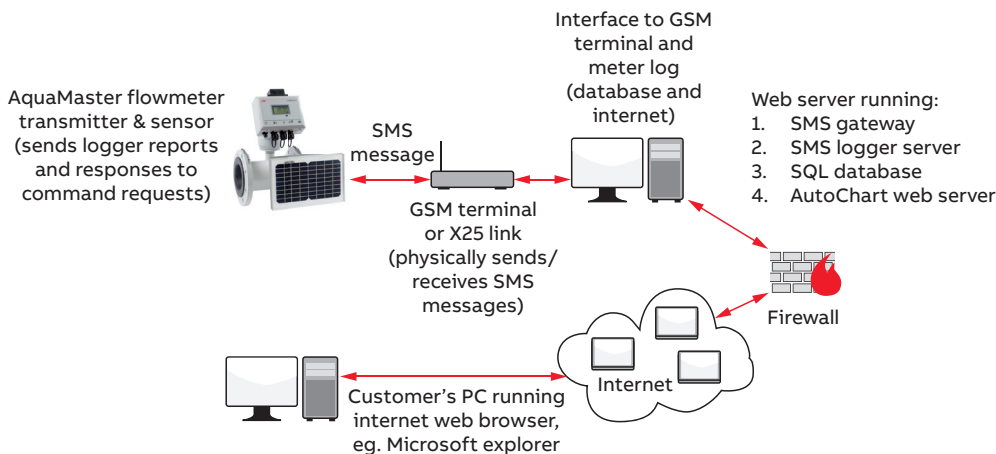
As well as downloading information, operators can also remotely reconfigure and maintain their AquaMaster flowmeters online. This makes it possible to change the configuration, read the flowmeter totals or carry out diagnostic tests without the time and cost of despatching an engineer or meter reader to carry out the work on site.

Using simple SMS Gateway solutions, the automated SMS meter readings can also be received, decoded and exported to an existing billing application or database to provide realtime usage information.

The integration of both the datalogger and GSM-SMS equipment into the AquaMaster has an additional benefit to leakage teams seeking accurate night line information as it eliminates quantization errors caused by counting from traditional pulses on discrete electronic or mechanical type meters. The AquaMaster's integral logger takes the flow rate data directly from the precise true flow rate measurement section of the flow meter and feeds this to the GSM-SMS section for wireless transmission.

In some applications, security of information is critical. As protection against interception, the AquaMaster encodes the flow data with a dual-key encryption system, which is currently believed to be uncrackable.

As further protection, every AquaMaster in the world has a unique, hash-encoded, service password which changes every time it is being used, thus protecting the first security key. Received SMS logger data messages are deciphered by a Windows DLL (Dynamic Link Library) provided by ABB, with the second key for unscrambling the coded message provided by the secure ABB SMS Logger Server application.



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The GSM option is available for the mains, battery and renewables 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.



With renewable, battery and mains power options, plus GSM communications technology, ABB's AquaMaster 3 electromagnetic flowmeter offers an expanded range of possibilities for collecting up-to-the-minute flow data, even in remote locations.

The addition of GSM-SMS technology, together with the availability of mains-independent battery, wind and solar powered units and integral data loggers, makes ABB's AquaMaster an ideal choice for flowmetering in remote locations.

Specifically designed to meet the water industry's stringent demands for enhanced metering capability, the AquaMaster enables ever more efficient and cost-effective operation and compliance with increasing legislative requirements.

Available in sizes from 10 to 600 mm ($\frac{3}{8}$ to 24 in), the AquaMaster 3 offers a choice of mains and battery power options, plus an all-new renewable power version which can draw power from either solar or wind-powered energy sources.

A simple DC (6 to 21 V) connection can be hooked up to sources as small as a 5 W solar panel or 60 W equivalent wind supply. When coupled with its use of super capacitor (SuperCap) energy storage technology, this feature totally eliminates the need for either mains or battery power, ideal for highly remote locations.

Where the battery is utilized, the SuperCap enables the battery to be replaced without loss of logger contents.

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.

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