

In situ verification made easy

How to ensure flowmeter performance and continued accuracy using ABB's in situ verification tools

Enhanced long term accuracy and reliability through in situ verification

Measurement made easy



Introduction

The ability to check the on-going performance of flowmeters in both water and process industry applications is growing in importance as users demand ever greater levels of accuracy.

Traditionally, carrying out such checks incurred disruption and cost as devices either had to be removed to a laboratory for testing or else heavy ancillary equipment had to be brought into carry out the checks.

Where electromagnetic flowmeters are concerned, the development of in situ verification technology has helped to

transform the scope for carrying out checking the accuracy of installed devices in both water and wastewater and process applications.

Involving the checking and verification of all aspects of a flowmeter installation, including the transmitter, the sensor coils and cabling, in situ verification uses a fingerprint taken at the time of manufacture as the benchmark for future performance. Any deviations from this benchmark will therefore be indicative of a potential problem, which can be pinpointed and rectified before it can escalate.

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The Application

Whether a meter is installed in a waste water or process application, the accurate measurement of flow is a critically important requirement. As well as being a key indicator of efficiency, understanding the flow through a pipe is also a vital contributing parameter in the calculation of cost.

In situ verification therefore provides an excellent means of checking flowmeter performance without incurring the disruption and added expenditure associated with removing the meter from the line.

Examples of where in situ flowmeter verification may be desirable include custody transfer applications in the oil and gas industry, measurements in food and pharmaceutical industry production and measurement of effluent flows in wastewater treatment and discharge applications.

The Challenge

Confusion often surrounds the difference between verification and calibration. A verification check does not calibrate a flowmeter but rather ascertains whether the performance of the meter is still in line with its original factory-calibrated values.

The frequency of checking is another area where uncertainty often arises. Where this is concerned, there are no hard and fast rules that apply across the board. Instead, the frequency with which a meter should be checked will tend to rely on what's being measured and the importance attached to ensuring accurate measurement. In many cases, the frequency of checking may actually be set down by an authority or industry practice. For example, inter-company transfer meters may stipulate checking on an annual or six monthly basis.

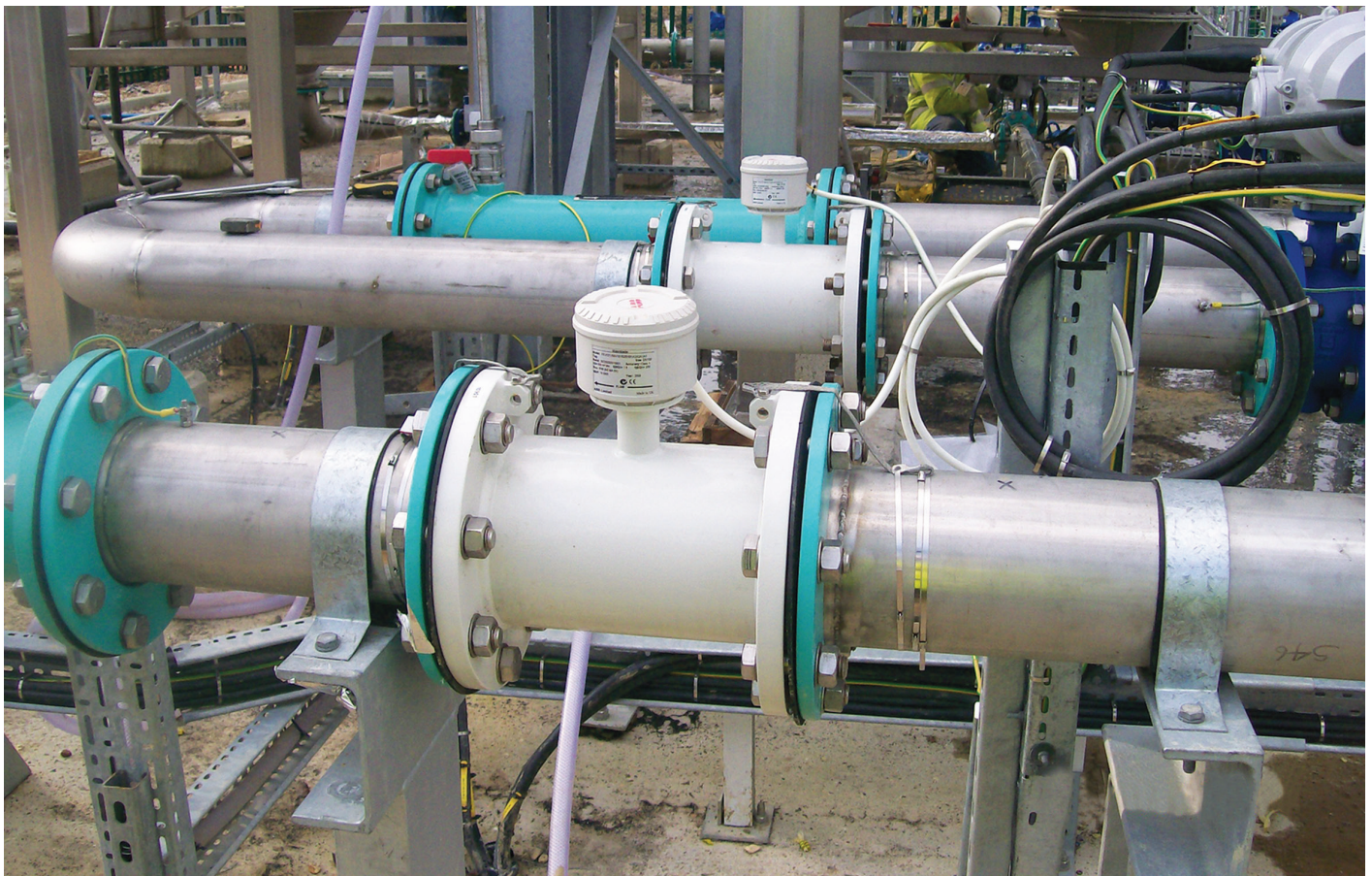


Fig 1: In situ verification provides the ideal solution for checking flowmeter performance without the disruption and cost of removing the meter from the line

The Solution

ABB offers a choice of in situ verification tools for its electromagnetic flowmeters.

Users of ABB's MagMaster and AquaMaster flowmeters can use ABB's CalMaster2 suite of field validation and in situ verification tools. CalMaster2 is comprised of two elements. The CalMaster IRIS (Intelligent Recognition Information System) is a standalone battery-powered test device that verifies an in situ flow meter system. It allows the user to perform in situ verification of both ABB's mains and battery-powered flow meter systems.

It can be used not only to check a meter's current operational status, but also to predict future faults. Users are given a traditional calibration verification with an uncertainty statement. When interrogating meters without existing fingerprint files, CalMaster IRIS assures operators of ± 2 percent accuracy. For fingerprinted meters, it assures end users of an industry beating ± 1 percent accuracy.

CalMaster IRIS enables users to download their test data to a PC for analysis and to easily print their own verification or service reports.

CheckMaster is a field validation device for contractors that checks whether a MagMaster or AquaMaster metering system has been installed properly and is functioning correctly.

Both CalMaster IRIS and CheckMaster are based on standalone battery-powered devices, which can store the results of up to 100 tests.

ABB's WaterMaster also features VeriMaster, a built-in tool providing users with the ability to perform in situ verification on meters from 10mm up to 2,400mm. Verification diagnostics monitor and validate across a performance-wide matrix, while precision flow measurement techniques are employed in the sensor with an octagonal bore at core sizes.



Fig 2: The performance of ABB's WaterMaster flowmeters can be verified using their on-board VeriMaster diagnostic software

The VeriMaster software tool enables operators to quickly produce a printed verification certificate for regulatory compliance.

Verification of the performance of ABB's ProcessMaster and HygienicMaster flowmeters can be carried out using the ScanMaster diagnostic and verification software tool. The software performs an in situ check both of the flow sensor and the transmitter, comparing current performance against the original fingerprinted calibration values. Test results are saved in a database ready for printing when required.

ABB has extensive experience in the design, manufacture and lifelong support of electromagnetic flowmeters for water, wastewater and process applications.

For more information, visit www.abb.com/measurement or contact your nearest ABB representative.

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