ABB MEASUREMENT & ANALYTICS | APPLICATION NOTE

Recording and Control in water abstraction applications

Managing borehole abstraction

Ensures compliance with abstraction licensing requirements

Measurement made easy

Water industry

Introduction

Water is a valuable commodity that needs to be carefully managed in order to ensure sufficient supplies are available for everything from residential and leisure purposes through to industrial, commercial and agricultural use.

With just 0.32 % of the Earth's total water supply being immediately fit for human use, it is vital to ensure that available supplies are monitored and measured as carefully as possible. Recognizing this fact, many industrialized countries have put national strategies in place both to regulate water use from surface and underground water supplies and to safeguard the quality of those supplies.

Measuring the amount of water abstracted from boreholes is one of the ways in which consumption of water is managed. There are varying international standards, for example in the UK anyone wishing to abstract more than 20 cubic meters (approximately 4,400 gallons) a day must hold an abstraction license.

The abstraction licenses specify a number of criteria, including:

- Details of where the water can be abstracted from
- The amount of water that can be abstracted
- The purposes for which the water can be used

A key requirement on license holders is the need to measure the volume of water abstracted. Depending on the category of license, measurements need to be taken and submitted at different frequencies, ranging from daily through to weekly and monthly. Furthermore, license holders are also required to maintain a precise record of meter readings.

The process

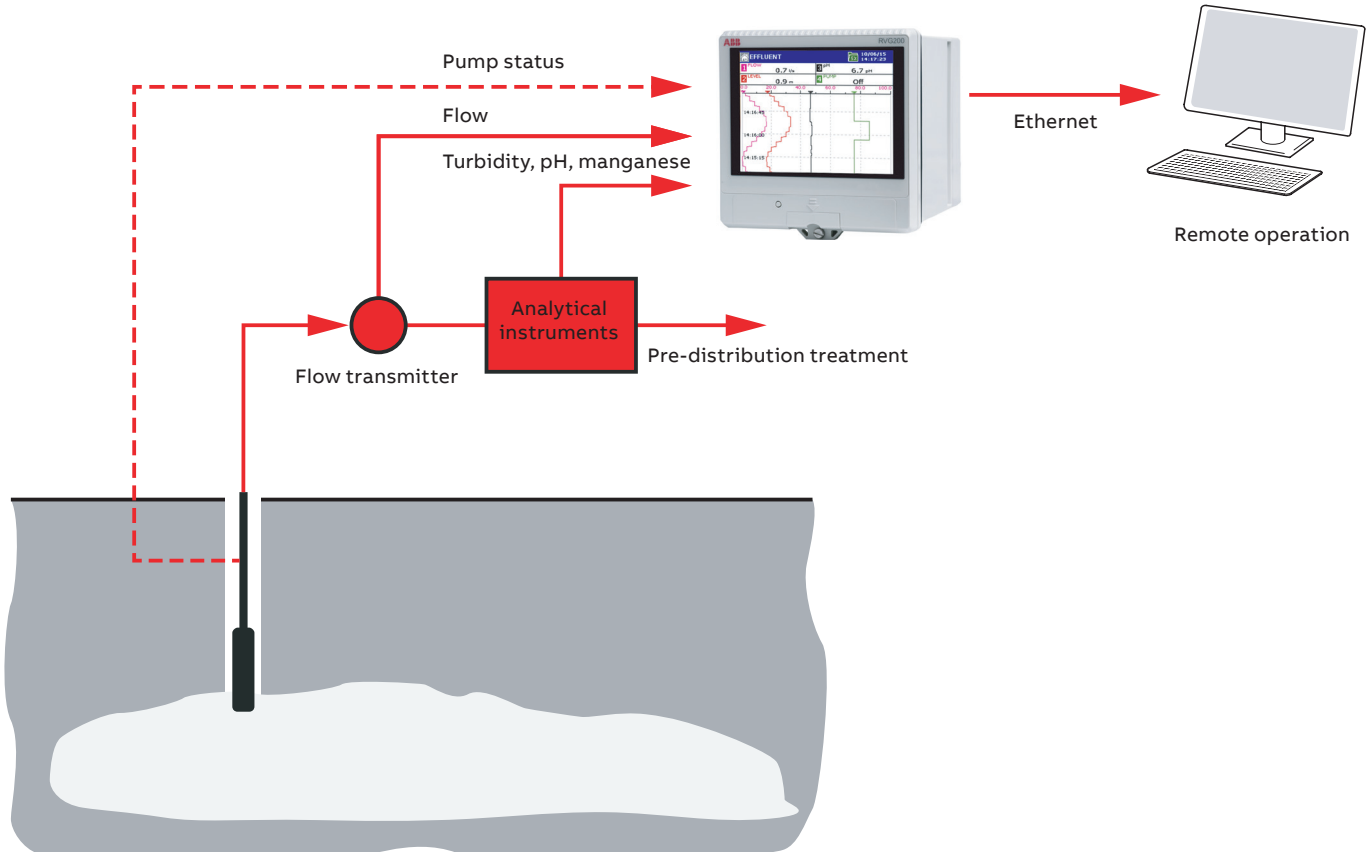
Since October 2001, a limit of 12 years has been set for abstraction licenses, after which time the license holder must reapply for their license. Part of this application process requires the license holder to prove that they have been using their supplies efficiently and in accordance with the terms of their license.

An added challenge is the need to prove that the water abstracted is fit for human consumption and that it meets the required levels of quality. It is also recommended that the license holder ensures the backflow measurement in the flowmeter is recorded. This can save valuable time in looking for leaks that do not exist.

A combination of ABB electromagnetic flowmeters and ScreenMaster paperless recorders are used to regulate water abstraction from both borehole and surface water supplies. The flowmeters provide accurate measurement of the quantity of water abstracted. The data from the flowmeters is then recorded by the ScreenMaster recorder.

To help safeguard water quality, ABB's ScreenMaster recorders can also receive data from on-line analytical instruments measuring parameters such as turbidity, pH and manganese. This data can then be analyzed or used as the basis for further reporting.

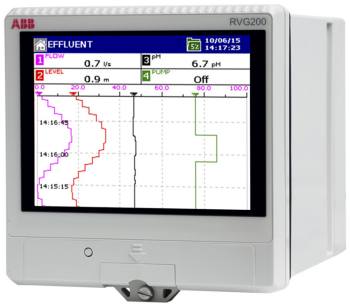
The data collected in the recorder can easily be downloaded to a PC. This data is then used in creating reports to be submitted by the company to the Environment Agency to demonstrate its compliance with the terms of its abstraction license.



What ABB products are suitable?

ScreenMaster RVG200

A 24 input touch screen recorder featuring swipe gesture control providing fast and intuitive operation. Process data (for example, flow, turbidity, pH, manganese) is displayed clearly to the local operator through a variety of formats, including chart, bar graph and digital indicator. The RVG200 is capable of collecting data from the flow meters and analyzers using Modbus communications, without the need of an analogue input card.



ScreenMaster RVG200 paperless recorder

Flow totalizers can easily be configured to reset automatically at specific intervals (for example, daily, weekly or monthly). When reset, the totalizer value is recorded in the totalizer log to provide a convenient history of flow totalizer values. When monitoring flow totals that must conform to strict limits (for example the total amount of water abstracted), the recorder's alarms can be configured to warn that a limit is approaching or has been reached.

Totalizer Log 05/09/14 08:45:09

No	Tag/Value	Source Tag	Date	Time
32	Daily	Flow 1	02/09/14	00:00:00
Σ	35908 kJ			
33	Daily	Flow 1	03/09/14	00:00:00
Σ	35999 kJ			
34	Daily	Flow 1	04/09/14	00:00:00
Σ	36099 kJ			
35	Daily	Flow 1	05/09/14	00:00:00
Σ	36014 kJ			
36	Daily	Flow 1	06/09/14	00:00:00
Σ	36000 kJ			
37	Weekly	Flow 1	06/09/14	00:00:00
Σ	258054 kJ			

Totalizer Log

Other ScreenMaster features includes:

- Remote access and operation via Ethernet, telephone/ mobile network. Remote operation allows complete control of your process at the convenience of your PC, tablet or smartphone.
- Hose-down protection to IP66 and NEMA 4X.
- Automated process data management using DataManger Pro PC based historical data analysis tool

ABB also have other paperless recorders available to suit this application:

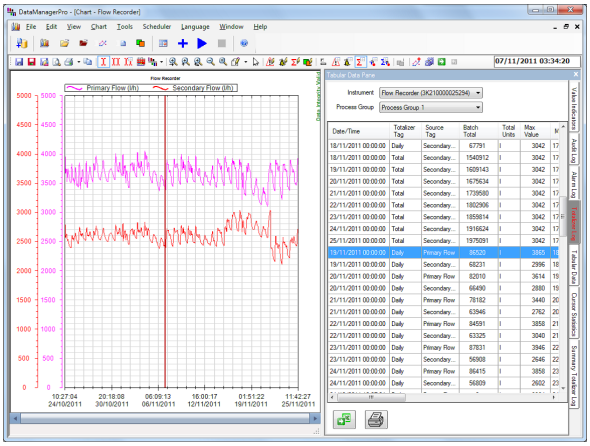
- SM500F (7 channel)

DataManager Pro

DataManager Pro is an advanced process data management and analysis application used to store and review data archived by ScreenMaster paperless recorders.

Some of the main features of DataManager Pro include:

- Functionality to annotate alarm, audit and totalizer logs on the chart enables quick and easy analysis.
- Ability to export the totalizer log information to Excel workbook format makes reporting fast and easy.
- Ability to compile graphical charts comparing multiple parameters, plus a dual cursor function enables operators to review data over specific periods of time and for specific recorders. Analysis function between the cursors show the minimum, maximum and average values.
- Functionality to add signatures and comments securely to the chart – ideal for approval or verification purposes. Also secure data packages (that maintain the original data file integrity) can be created and passed to customers for verification/analysis.



DataManager Pro Chart view

Acknowledgments
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