

CITY OF NEW YORK
DEPARTMENT OF ENVIRONMENTAL PROTECTION

Water Meter Data Output
To
Building Management Systems

Technical Note 2010-1



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Introduction

In response to a number of inquiries concerning methods of reading water meters through various types of building energy or facility automation systems the Universal Metering/Technical Services Division of DEP's Bureau of Customer Services has produced this Technical Note. It will be revised regularly since advances are being made in this field on a regular basis.

Background

Most water meters used for utility service have absolute encoder registers which means that firmware is used to query the register to obtain a direct read of the meter dials based on their physical positions. Traditional electric and gas meters have pulse-type registers where a pulse represents a certain volume of gas or number of watt-hours and the receiver of the pulses must know both how to translate the pulse into consumption and what the starting reading is for the meter, since the pulse provides data but not a reading.

There are serious limitations to remotely read pulse-based water meters from a utility perspective. A remote display or totalizer for a pulse-based meter is easily defeated or disrupted and must be reset if there is any interruption in communication such as a broken or loose wire. Further, large buildings often have two or more cross-connected water services and if back flow prevention devices are not working properly it is quite possible that reverse flow will occur that will not be properly measured by pulse-based devices. If a pulse device is to be used, one that registers in both directions is preferred.

The instrumentation industry has been slow to produce low-cost devices that can convert an absolute encoder reading into a format acceptable to facility automation systems such as a pulse or 4-20 ma signal.

The remainder of this Technical Note describes both existing and expected solutions to this problem.

Dual Output Meters and Meter Attachments

Several manufacturers offer meters that either have dual-output built in, or available as an option:

Sensus' T2 and C2 series of meters have standard dual-output registers providing both absolute encoder (Sensus ASCII protocol) and programmable frequency pulse output.

<http://www.sensus.com/Module/Catalog/WaterCategory?id=84>

Metron-Farnier offers the HRI Pulse Output Module as a clip-on addition for its encoder registers that provides a switch closure output for the company's Spectrum single-jet meters.

Metron is planning to release its electronic E-register in mid-2011 that will provide output in the customer's choice of two of three formats: encoder with pulse or 4-20 ma. The all-electronic register can display cubic feet or gallons and will have a resolution of 0.1 gpm.

<http://www.metronfarnier.com/index.php>

Neptune Technology Group provides two versions of their Tricon/E3 that installs between the meter body and the register of any of their positive displacement, turbine, compound or fire service type meters. Versions with 4-20 ma analog or high frequency forward-reverse pulse output are available. The Tricon/S provides switch closure output in several variations.

<http://www.neptunetg.com/systems/meters/metering-systems/#/MetersSystem/MeteringSystems>

Elster/Amco currently offers dual pulse outputs for its evoQ4 electromagnetic meters and plans dual encoder output and pulse output in the 2011-2012.

<http://www.elsterevolution.com/evoQ4features.php>

F.S. Brainard & Company/Meter-Master manufacturers flow and pressure monitoring equipment and software that is compatible with several manufacturers' water meters. The Model 80 Encoder Interface can be wired to a meter register to provide pulse, encoder and for 8-wheel output encoder registers, 4-20 ma outputs. It has not been tested with the AMR system DEP is using and it presently does not work with Radio (RF) AMR systems (just touch read systems). Other Meter-Master products include flow sensors with pulse and 4-20 ma outputs compatible with most manufacturers' water meters. Engineers should examine the choices for applicability to their particular system.

<http://www.meter-master.com/index.html>

Permit Issues

Before any meter attachment device is placed on a meter a "Break Seal" permit must be obtained from the Borough Office of the DEP Bureau of Customer Services. This is a "no fee" permit with the specific purpose of informing DEP that such an attachment is being installed and for DEP to ensure that the basic operation of the meter for billing purposes is retained after the attachment is installed. The completed permit must be returned to the DEP-BCS Borough Office within ten (10) days of completion of the work.

AMR Data

DEP is moving toward a fixed network AMR system and installation of meter transmitters is 78% complete as of April 19, 2011. During the summer of 2010 DEP began to provide access to customers to their water consumption data collected with the AMR system. In the near future that will include the ability to download meter readings from the DEP website.