

CITY OF NEW YORK
DEPARTMENT OF ENVIRONMENTAL PROTECTION

Water Meter Data Output
To
Building Management Systems

Technical Note 2010-1
Bureau of Customer Services



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Introduction

In response to a number of inquiries concerning methods for reading water meters through various types of building energy or facility automation systems the Technical Services Division of DEP's Bureau of Customer Services produced this Technical Note.

Abbreviations Used in This Document

AMI: Advanced Metering Infrastructure (aka Automated Meter Reading)
BCS: NYC DEP's Bureau of Customer Services
BMS: Building Management System, alternatively EMS or FMS
DEP: New York City Department of Environmental Protection

Background

The "register" is the part of a meter that counts, totalizes and communicates consumption information. Most water meters used for utility service have absolute encoder registers meaning that they store and communicate a totalized reading. 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 a BMS such as a pulse or 4-20 ma signal. Until recently, water meter manufacturers had been slow providing registers with dual output capability.

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 have either dual-output as a standard feature or available as an option:

Sensus' OMNI T2, C2, R2 and F2 series of high-resolution meters have standard dual-output registers providing both absolute encoder ("Sensus" ASCII protocol) for the AMI system and programmable frequency pulse output. While the standard commercial variant of this meter has a dual-output register, most of the Sensus OMNI meters purchased by NYC DEP are single

output to the AMI system. A building owner can contract with Sensus to replace the standard register with a dual-output register at their expense. The building water supply must be temporarily shut for register replacement. A permit from the local DEP-BCS office is required.

Metron-Farnier now furnishes a high-resolution electronic Innov8 register with all of its meters. The version used by DEP has an output to the AMI system and a five-minute increment data logging memory downloadable with the manufacturer's Windows-based software and radio receiver. The Innov8 is also available from the manufacturer with pulse or 4-20 ma outputs along with the AMI connection. A permit from the local DEP-BCS office is required. A building water shutdown is not required for this register replacement task.

Neptune Technology Group provides two versions of their Tricon/E3 that installs between the meter body and the E-Coder register of any of their positive displacement or turbine 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.

F.S. Brainard & Company/Meter-Master manufacturers flow and pressure monitoring equipment and software that is compatible with several manufacturers' water meters. The new Smart Meter Master is an interface box that connects to a water meter and has output to both the utility AMI system along with pulse, 4-20 ma and other outputs.

SCADAMetrics also sells an interface panel, the **Ethermeter**, that connects to a water meter and has pulse and Modbus outputs in addition to connection to the utility AMI system.

Permit Issues

Before any meter attachment device is installed, a permit is required 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. If a register is being replaced the final read from the old register must be provided on the completed permit.

AMI Bulk Data Extract

DEP has been reading meters with a citywide fixed-network type AMI system since 2009. We read smaller water meters four times a day while larger meters are read hourly. Users can register with "My DEP Account" on the DEP website to view graphs of their consumption as well as individual readings. Users with programming capability can also avail themselves of a Bulk Data Extract API that will deliver daily consumption data in XML or JSON format for all accounts/meters registered under a My DEP Account Username. To enroll, provide your MDA Username to RMulvaney@dep.nyc.gov or amrbde@dep.nyc.gov. You need to have the programming abilities to customize and develop the API.