

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 water 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 or previous reading is for the meter, since the pulse provides interval 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. DEP does not endorse any specific manufacturer. The meter attachments listed here are the responsibility of the property owner. Data from meter attachments is not recognized for billing purposes.

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 this register replacement. A permit from the local DEP-BCS office is required. Sensus' regional representative at this writing is Don O'Neil (don.oneil@sensus.com)

Metron-Farnier 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. www.metronfarnier.com

Neptune Technology Group provides two versions of their Tricon that install between the meter body and the 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 provides switch closure output in several variations. A building water shutdown is not required for this register replacement task. <https://www.neptunetg.com/products/water-meters/>

F.S. Brainard & Company/Meter-Master manufacturers flow and pressure monitoring equipment and software that is compatible with most manufacturers' water meters. The new Smart Meter Master (SMM) is an interface box that connects to a water meter and has output to both the DEP AMI system along with pulse, 4-20 ma and other outputs. The connections from the meter to the Smart Meter Master and from the SMM to DEP's AMI MTU must be made by Nicor Hydroconn connectors for easy connection/disconnection. <http://www.meter-master.com/products/products.html>

SCADAmetrics manufactures the EtherMeter – a water meter network gateway that translates a water meter's encoded consumption and flow-rate signals into Modbus/TCP and Modbus/RTU (Modbus is a communication protocol that is compatible with certain building management systems). Permissible Models: EM-100/NYCDEP. Please visit scadmetrics.com for more information. The connections from the meter to the EtherMeter and from the EtherMeter to DEP's AMI MTU must be made by Nicor Hydroconn connectors for easy connection/disconnection.

SCADAmetrics also manufactures the Radio-Read Filter (RRF) – a signal splitter that enables a water meter's encoded consumption signal to be split between a NYC DEP AMR box and a parallel, customer-owned meter-reading device. While the use of the Radio-Read Filter is permitted, the customer-owned meter-reading device must be pre-approved by NYC DEP as meeting NYC DEP's polling period limitations. Permissible Models: RRFW/Nicor and RRFD/Nicor. Please visit www.scadmetrics.com for more information. The connections from the meter to the RRF and from the RRF to DEP's AMI MTU must be made by Nicor Hydroconn connectors for easy connection/disconnection.

The Sensus, Metron and Neptune devices are straightforward register replacements and should be processed as such. However, we suggest that owners interested in the EtherMeter or Smart Meter Master contact the vendor and then contact DEP-BCS' Technical Service Division (Michael Roach mroach@dep.nyc.gov or Barron Manning BarronM@dep.nyc.gov)

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) business 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” (MDA) 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 amrbde@dep.nyc.gov . You need to have programming abilities to customize and configure the API.