

Using ClearSCADA and the DNP3-WITS Water Telemetry Standard for Gathering Flow and Pressure Data from District Metered Areas

Graham Nasby, P.Eng, PMP, CAP^{1*}

¹ City of Guelph Water Services, 29 Waterworks Place, Guelph, Ontario, N1E 6P7, Canada

(*correspondence: graham.nasby@guelph.ca)

FORMAT

45 minute presentation

KEYWORDS

DMA, Leakage, Telemetry, Water Efficiency, DNP3-WITS, Auditing, Distribution, Flow Modelling, Pressure

SHORT ABSTRACT (100 WORDS)

From 2016-2018, Guelph Water Services, a Canadian drinking-water utility with a service population of 140 000, undertook a project to upgrade and expand district metered areas (DMAs) in its distribution system. The DNP3-WITS protocol (water industry telemetry standard) is used by ClearSCADA software to gather flow/pressure data from 50 magnetic flowmeter units located throughout the city. Guelph Water is the first deployment of DNP3-WITS in North-America. The system features automatic time-stamping of data, built-in store/forward datalogging, and remote configuration/diagnostics. The DMA flow and pressure data is used to track leakage, audit customer metering, prioritize pipe repairs/replacement, and for the city's hydraulic model.

LONG ABSTRACT

From 2016-2018, Guelph Water Services, a Canadian drinking-water utility with a service population of 140 000, undertook a project to upgrade and expand district metered areas (DMAs) in its distribution system. Started in 2013, the DMAs have been created by closing specific street valves, so water usage in DMAs can be monitored by 2 or 3 flowmeters installed on the inlets to each DMA. Guelph selected a DMA metering system that uses magnetic flowmeters installed into valve chambers located throughout the city. Each flow meter is accompanied with a flush-to-the-ground boulevard box which contains a battery powered transmitter, complete with a built-in data-logger and cellular data modem.

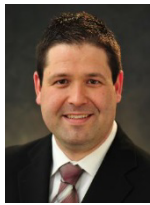
The topic of this paper is the new DMA flowmeter telemetry system that was deployed as part of the 2016-2018 upgrade. Based on the UK's Water Industry Telemetry Standard (DNP3-WITS) and ClearSCADA software, the new telemetry system now allows the city to remotely manage the configuration of its DMA flowmeters and easily gather/store DMA flowmeter data into its SCADA system. The ClearSCADA system running DNP3-WITS protocol is used to track system leakage, audit customer metering, prioritize distribution piping for repair/replacement, and feed data into the city's hydraulic model.

The DNP3-WITS protocol is an industry-standard protocol that has been developed by water utilities in the UK who wanted a standardized telemetry protocol that is tailored to the needs of the water industry (www.witsprotocol.org). Features of DNP3-WITS include remote configuration management of flowmeters and other instrumentation, ability to remotely manage RTU/PLC configurations, automatic

store/forward data-logging built right into the protocol, detailed telemetry diagnostics, and automatic calculation of min/max/average/totals for process values. ClearSCADA is one of the certified SCADA software packages that supports the DNP3-WITS protocol package for managing flowmeters, dataloggers, pump controllers, smart instrumentation, and various RTUs (remote terminal unites).

The presentation will provide an overview of Guelph's DMA flowmeter system, a review of the flowmeters used, how the DNP3-WITS telemetry system was deployed using ClearSCADA, and an introduction to the many technical benefits of using the DNP3-WITS protocol. Guelph Water represents the first deployment of DNP3-WITS protocol in North America.

ABOUT THE AUTHOR



Graham Nasby, P.Eng, PMP, CAP holds the position of Water SCADA & Security Specialist at City of Guelph Water Services, a publicly-owned water utility located in Guelph, Ontario, Canada. He is an active member of the AWWA and WEF, and currently sits on the Automation Committee of the Ontario Water Works Association. Graham is co-chair of the ISA112 SCADA Systems Standards committee with the International Society of Automation. He is also a voting member of both ISA18 Alarm Management and ISA101 HMI Design standards committees. During the past 15 years, he has published over 40 papers on a wide range of automation topics. Contact: graham.nasby@guelph.ca