HNS HYDRANT NETWORK SOLUTIONS INC.

smart water

real time data

water quality

system pressure

Hydrant Data Rod

An innovative application to monitoring water distribution system pressures.

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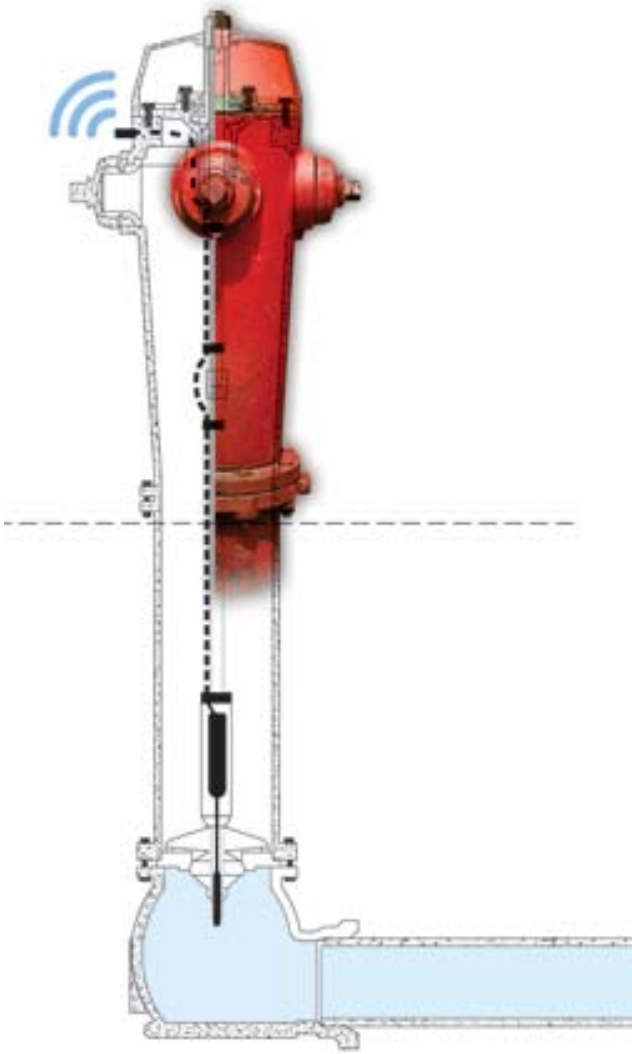
We have developed a non interrupting on line water distribution system pressure monitoring system for compression type wet and dry barrel fire hydrants.

This application can be used in all climates without any interference to the operation and maintenance of the hydrant and can be easily relocated from one hydrant to another of the same manufacturer.

Benefits

- enhanced on line **hydraulic overview** of the distribution system.
- calibration of hydraulic **modelling** programs.
- system **hydraulic profiling**.
- **alarm on low pressure** events to avoid back-siphonage and **water quality** degradation.
- **alarm on high pressure** events to avoid damage to the system.
- monitoring for unauthorized **hydrant operation**.
- multiple methods of **data collection** including integration to a **SCADA** system.
- **reduced maintenance costs** due to stainless steel retrofitting.
- a **cost effective solution** compared to building a chamber to house a pressure transmitter.



Case Study

Chatham-Kent PUC HNSi Hydrant Data Rod

Proof of Concept Case History

The initial HNSi proof of concept Hydrant Pressure Transmitter was installed in the Chatham-Kent Public Utilities Commission (PUC) Distribution System in May of 2011. Data capture was set-up using SMS text transmissions via a cellular device installed in the transmitter. A custom software script converted the transmission file and wrote the data into a database for storage and reporting.

In July of 2011, the transmitter was moved to a new location in the vicinity of a commercial greenhouse as a part of a study trying to evaluate the impact of adding new commercial greenhouse units. During the study period, each day between 12:00 and 13:30 hours, a significant pressure drop at the monitoring site was noted. See the "before" trend. An investigation of the existing greenhouse water consumption practice was completed. The owner noted that water was typically only drawn between the hours of 09:00 and 16:00.

Further investigation revealed that an abandoned 2 inch flushing line was still opening to atmospheric pressure on an automated timer, this coincided with the noted pressure drop. The flush line was decommissioned on August 23rd, 2012, and the pressure profile stabilized. See the "after" trend. It is estimated that at the typical pressure in the system at this point, this action saved the PUC approximately 0.5 ML of water per day.

This is one example of an excellent use of this technology. Given the low cost and mobility of this device, others include; monitoring suspected low pressure points within the distribution system, monitoring and feeding real-time pressure data back to the SCADA system and hydraulic model interface for real-time calibration in those difficult to monitor areas, and implementation of new control monitoring points for strategies that involve operating at a lower distribution pressure.

Note that the technology uses a battery for its power source. At the time of writing of this material, the device, had been in service in a Canadian installation (cold climate in the winter) for 15 months, still operating effectively.

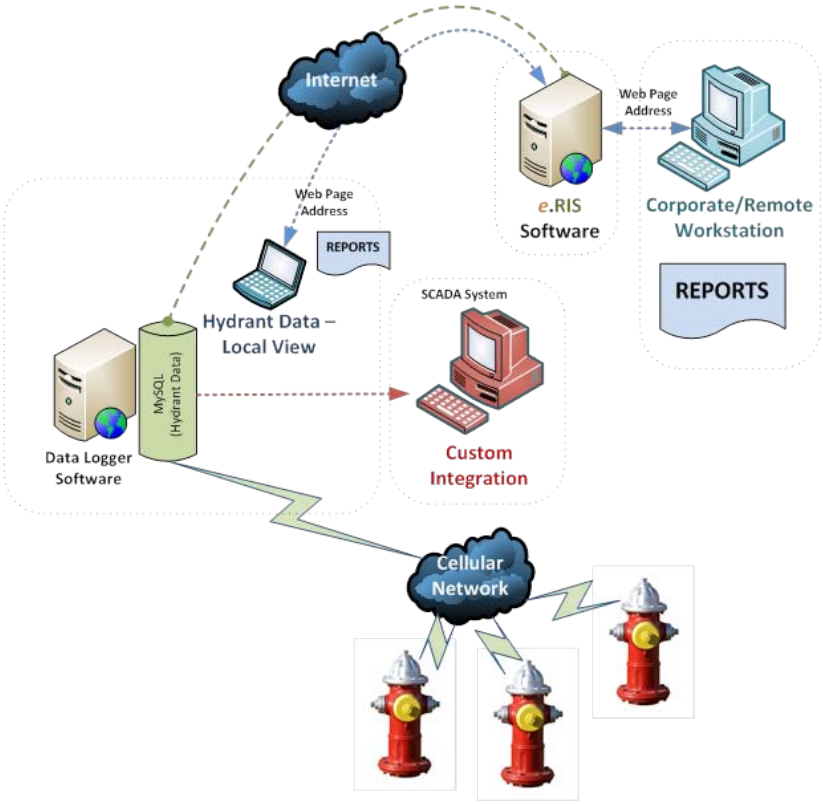
Chatham-Kent

Data Collection, Monitoring & Reporting

The pressure monitoring device, once installed in the hydrant, is immediately available to transmit pressure readings. Installation of a unit takes approximately 45-60 minutes and can be performed by our preferred installation partner Precision Hydrant Services, our the end users own hydrant experts.

Once active, the hydrant pressure monitoring system collects pressure readings to a data logger at a user defined sampling frequency. Information is sent from the data logger to a POP e-mail account using a GSM SIM card installed in the data logger. The e-mail is then received at a third party location and the pressure settings are captured in a MySQL database.

Once in the MySQL database information is made available through the e.RIS software. The e.RIS software provides a web based interface for the user to view the pressure values and battery life of the data logger. Multiple pressure values can be viewed on the same chart allowing a user to analyze the pressure throughout the distribution system at the locations of the hydrant monitoring devices. Access to the web based reports, data queries and data extraction tools are available from any computer with internet connectivity.



Data is hosted by a third party, however all data can be downloaded by the end user at any time into easy to access formats such as MS-Excel, MS-Word or PDF. Reports can similarly be exported into the various formats available.

The graphic above identifies the data and information flow through the system.

In addition to the above, the data logger can be configured to issue high and low pressure alarms.

The end user, if desired, can also integrate the data into their SCADA system using the information captured in the MySQL database. Custom integration services can be provided by Eramosa Engineering, our preferred integration partner, or through the end users integration provider.

Technical Specifications

Keller GSM2 Datalogger

Connection	For Series 30 level transmitters or Series DCX data loggers with digital interface RS485
Protection Class	IP65
Supply	Lithium-Battery DD 3,9 V / 32 Ah
Battery Life *	Up to 10 years at 1 measurement per hour and 1 transmission per day
GSM-Band	Quad 850/900/1800/1900 MHz
Transfer Options	E-Mail (SMTP and POP3), SMS and Data Connection (V.32 / V.110)
Antenna	Interface SMA Female
Supply for Sensors	12 V / 5 V / 3,7 V
Interfaces	RS 485 KELLER-BUS / 2 Voltage Input (0...2,5 V, 10 Bit) / 2 Digital Inputs / optional: SDI-12, …
Temperature Range	-20 ... 50 °C
Shortest Meas.-/Sending Rate	1 minute
Housing Material	Stainless Steel 316L (DIN 1.4435)
Housing Dimensions	48 x 330 mm (diameter x length)
Integrated Barometric Sensor:	
Accuracy / Resolution	typ. + 0,5 mbar (-20...40 °C) / typ. 0,2 mbar
Long-Term Stability	typ. +1 mbar (12 months)
Temperature Accuracy	typ. + 1 °C, Resolution typ. 0,2 °C

** External influences could reduce battery capacity*

Preciseline Pressure Transmitter

Available ranges	
Relative	Infinite from 0...2 to 0...500 PSIG
Absolute	Infinite from 0...2 to 0...500 PSIA
Sealed	Infinite from 0...500 to 0...15,000 PSIS
Proof Pressure	Varies by range, 10X for 1 PSI to 1.1X for 15k psi
Accuracy, TEB6	Standard 0.25% FS TEB Optional 0.1% FS TEB
Comp. Temp. Range	-10...80° C
Operating Temp.	-40...120° C
Output	4...20mA + RS485 0...5VDC + RS485, 0...10 VDC + RS485
Resolution	0.002% FS
Supply	
4...20 mA Output	8...28VDC
0...5 VDC Output	8...28VDC
0...10 VDC Output	13...28 VDC
RS485 Only	std. 8...28 VDC, opt. 3.3...12VDC
Load Resistance	
Current	<(Supply-8V)/0.02A
Voltage	>4k ohm
Wetted Materials	Standard 316L S.S., Fluorocarbon
Process Connection	1/4"-18NPT Male
Electrical Connections	std. 10 ft. Cable, DIN43650 , or mPm 393 opt. MIL-C 26482
CE-Conformity	EN50081-1, EN50082-2
Shock	20g (11ms)
Vibration	20g (5-2KHz, max. amp ±3mm per IEC68-2-6)
Environmental Protection	
Cable	IP68
DIN43650, mPm393	IP65
MIL-C 26482	IP65
Cable	Std Polyethylene, opt. Hytrel or Tefzel
Optional Accessories	Drying Tube, Aneroid Bellows 1/2"NPT Conduit Fitting RS485 Converter Cable Termination Enclosure Digital Meter / Process Controller

Pressure transmitter specifications are provided for information only. Actual model number and configuration is subject to change as part of the hydrant data rod setup prior to installation.

Rod materials

304SS

torque tested to AWWA standard C502-05

While all reasonable attempts have been made to ensure the accuracy of the information contained within the specifications, these technical specifications are subject to change without notice.

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