



MLOG

Managing Water Loss Using Acoustic Sensors and Advanced Wireless Communications

MLOG is a system of intelligent, wireless sensors which detects losses from the entire water distribution system every night. Each low-cost, battery-powered MLOG sensor is permanently installed on a service pipe near the water meter. MLOG sensors analyze and save vibration patterns from every location in the water distribution system, using advanced signal processing to characterize sound patterns in the pipes over time.

The water utility is alerted to the presence of leaks with the wireless transmission of MLOG sensor data. The MLOG desktop software reanalyzes all data from the entire network every day. Data from sensors and leaks is managed using GIS techniques with the information flow organized throughout the utility to include managers, planners and field personnel.

MLOG data can be transmitted from the distribution system in two ways, either via:

1. The utility's automatic meter reading (AMR) system; or
2. A hand-held or vehicle-based MLOG radio controller to read MLOG sensors in the field.

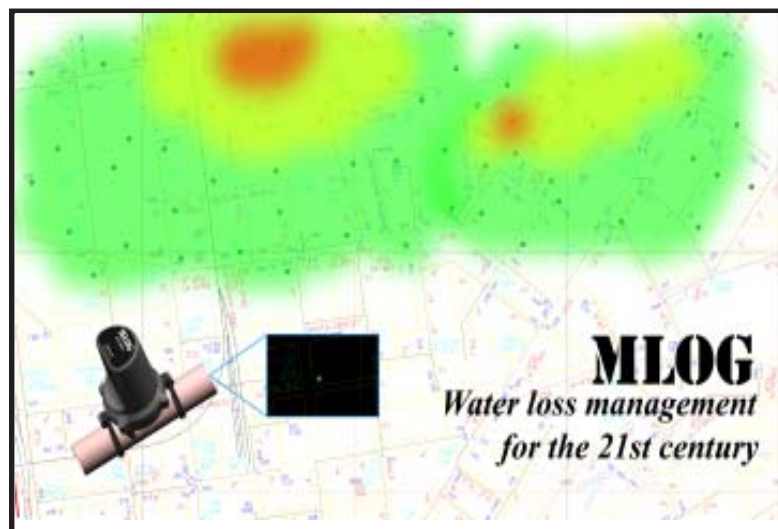
With both the AMR and controller approaches to data collection, information from thousands of MLOG sensors is brought to the utility manager's desktop every morning. The MLOG system can leverage the investment in AMR, often pay for itself within 2 years of a specified 15-year operating life, and provides an unprecedented amount of information about the integrity of the distribution system.

MLOG is an enterprise solution to leak detection throughout the entire water distribution system. It is the first economical and logistically sound approach to solving the problem of water loss between the treatment plant and the consumer, permanently reducing the production of non-revenue water.

For more information contact:

Flow Metrix, Inc.

2 Clock Tower Place, Ste 425
Maynard, MA 01754
978.897.2033/978.897.2497 (fax)
1.800.517.4737
www.flowmetrix.com





Comparison of MLOG and Other Logger Systems

Feature	MLOG	Other Logger Systems
Battery Life Warranted Expected	<ul style="list-style-type: none"> ▪ 7 years ▪ 15+ years of normal operation using integrated intelligent power management 	<ul style="list-style-type: none"> ▪ 3 years ▪ Up to 10 years if loggers are turned on/off with optional sleeper unit
Installation	<ul style="list-style-type: none"> ▪ Water service line at the meter (basement or meter pit) 	<ul style="list-style-type: none"> ▪ Underground valve chamber on mains
Logger Interrogation	<ul style="list-style-type: none"> ▪ AMR or utility meter reader as part of normal operations 	<ul style="list-style-type: none"> ▪ Utility personnel perform dedicated patrols
Wireless Data Retrieval AMR Connection Mobile Radio	<ul style="list-style-type: none"> ▪ Works with all industry-standard AMR devices ▪ 2-way MLOG radio controller downloads analysis data and programs logger in one operation 	<ul style="list-style-type: none"> ▪ No AMR connection capability ▪ Radio patroller transmits only leak / no-leak status ▪ Downloading 7-day data summary requires the physical retrieval of logger and optional handheld interrogator unit
FCC Requirements	<ul style="list-style-type: none"> ▪ 902-928 MHz, advanced frequency-hopping spread spectrum, approved by FCC for unlicensed operation 	<ul style="list-style-type: none"> ▪ 463 MHz, single frequency channel, annual FCC licensing required
Antenna	<ul style="list-style-type: none"> ▪ Internal (sealed) 	<ul style="list-style-type: none"> ▪ External, cabled, mounting kit & installation required
Environmental	<ul style="list-style-type: none"> ▪ Entire MLOG unit is sealed & waterproof (IP68) 	<ul style="list-style-type: none"> ▪ Potted electronics (IP68); antenna not waterproof
Leak Response Time Fixed network AMR Other wireless methods	<ul style="list-style-type: none"> ▪ Less than 24 hours ▪ Whenever water meter is read or on demand 	<ul style="list-style-type: none"> ▪ No AMR connection capability ▪ On patrol schedule or on demand
Data Analysis from Single Logger Overnight sound pattern Long-term sound analysis Frequency analysis Historical data record	<ul style="list-style-type: none"> ▪ Continuously from midnight to 4:30am ▪ Yes ▪ Identifies different types of leaks ▪ Unlimited lifetime data managed in MLOG system software 	<ul style="list-style-type: none"> ▪ Snapshot of data in the middle of the night ▪ No long-term analysis capability ▪ No frequency analysis capability ▪ 7-day summary available via manual download in the field
Data Analysis from All Loggers Leak Index Color Map™ Historical data & analysis Intelligent network-wide analysis	<ul style="list-style-type: none"> ▪ Yes ▪ Yes ▪ Yes, at any selected time ▪ Yes* 	<ul style="list-style-type: none"> ▪ No ▪ No ▪ No ▪ No
Software Integrated GIS maps & logger information Logger information exports to GIS Leak data exports to GIS Online support	<ul style="list-style-type: none"> ▪ Yes ▪ Yes* ▪ Yes* ▪ Yes, remote login by Flow Matrix 	<ul style="list-style-type: none"> ▪ No ▪ No ▪ No ▪ No
Cost	<ul style="list-style-type: none"> ▪ MSP: \$109-169, based on volume 	<ul style="list-style-type: none"> ▪ \$250-\$1,000 (actual sales prices 2004-2005)

* Available Q3, 2005