

R&D Testing for Calcium Treatment Water Filters

Delphin TopMessage Modular Data Acquisition System

CHESTERLAND OH—February 15, 2012

CAS DataLoggers recently supplied the data acquisition solution for a customer specializing in providing water purification filter systems and cartridges for industrial and household applications. These filter cartridges were widely used to improve water quality and taste, especially for coffee vending machines but including even large industrial plants. The filter material acted to reduce the water's calcium content, balancing its pH level and binding other metallic ions. The filter granule material itself was developed in the customer's R&D lab for each specific filter and purification treatment application individually, where they needed to be tested to gauge their effectiveness on water consumption. In the principal test setup, the water flowed through the filter unit from a storage tank holding a specific water quality and was then recovered in a wastewater tank. Each test covered several thousands of quarts of water and could take several days to finish. During the test cycle the pH level, conductivity and temperature were all measured in front and after the filter unit. The objective was to show the water pH & conductivity level behind the filter over the water consumption. Given this proprietary information, data security was very important for the customer as well the need for an automatic control to stop the test when the auto end criteria were reached. Some tests ran over several days and over weekends, so any breakdown of the recording and test process required a follow-up test, wasting both time and test water. Therefore the customer required a reliable, standalone data acquisition and control system to handle all R&D testing. This system would also need to feature powerful software for quick configuration and integrated test reporting.



Management installed a **Delphin TopMessage data acquisition system** equipped with an ADIT module and a DIOT module with 11 pulse counter inputs. The system's 10 universal analog inputs enabled an easy connection of the sensors via screw terminals, and could handle 30 analog inputs or 48 digital inputs. The modular and scalable TopMessage device offered the customer a range of I/O modules suitable for any number of channels and sensor types. A network interface enabled the TopMessage to be directly connected to a PC workstation or laptop/netbook computer. The TopMessage's universal inputs enabled the connection of signals of any type including non-isolated signals, so that costly measurement transducers were unnecessary. Potential isolation between channels and differential inputs saved both time and money. Measurements were made at high accuracy with up to 24-bit resolution. Signal conditioning took place within the device, which also supported connection to external equipment and PLC control. Configuration was handled via PC, while data transmission was handled via LAN (internet / intranet). Additionally, an optional integrated data memory could

permanently store up to 128 million measurement values without PC support and with edge or level triggering.

The TopMessage data logger's software channels automatically controlled the start of the test by opening the valve by one of the digital outputs of the DIOT module. The device also automatically performed the integration of the flow rate to show the total volume of water consumed. In combination of the limit channels and the max volume set point, the data logger closed the valve when the required water volume went through the filter. Due to the flexibility of the Delphin system, several filter materials could be tested in parallel. The device's on-board logic and calculation functions provided a complete stand alone operation which increased the test safety, especially over weekends when no lab engineer was present. The PC's display screen showed an overview of the TopMessage's analog inputs and calculation channels which were configured inside the CPU module of the data acquisition system.

Configuration of the Message device took place with the PC user-friendly DataService / Configurator software. Configuration data was processed online and permanently within the devices, while configuration data could be amended and adjusted during measurement runs. Apart from the automatic test operation through the software channels of the **TopMessage** data logger, a **ProfiSignal Basic** software application was developed to monitor the live data. The user-friendly ProfiSignal Basic software helped users to quickly configure the logger and set up the live data readings, analog and digital displays, and strip charts. The application provided a Y(t) graph for temperature and flow rate monitoring, while the pH level and the conductivity were plotted in a YX-chart over water quantity consumed. ProfiSignal Basic also featured integrated test reporting with graphs and indicators.

The main advantage for the customer following installation of the Delphin TopMessage data acquisition system was provided by its many stand alone control and recording functions. Standalone recording and process control and logic functions automated the entire test process without any reliance on the lab's PC. There were no breakdowns of the recording and test process, and follow-up tests became a thing of the past. Lab personnel also utilized the user-friendly ProfiSignal Basic software to set up the live data readings, analog and digital displays, and strip charts. Additionally, the data was kept highly secure with these reliable systems.

For more information on the Delphin TopMessage modular data acquisition system, other advanced Delphin data acquisition solutions, or to find the ideal solution for your application-specific needs, contact a CAS Data Logger Applications Specialist at (800) 956-4437 or visit the website at www.DataLoggerInc.com.

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