CAS DATALOGGERS

Testing Filtration Systems in Pools and Hot Tubs

dataTaker DT80 Intelligent Universal Input Data Logger

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CAS DataLoggers recently provided the datalogging solution for a customer who wanted to capture data to demonstrate how the latest design of their filter element could improve the energy efficiency of filtering systems for pools and hot tubs. To determine the efficiency of the system, several different types of data needed to be collected, including water flow rate, water pressure in the system, voltage, current and power for the pump motor, and water cleanliness. As these were all very different parameters, the tests required a datalogger with the flexibility to connect to most sensors and data measurement sources to capture all the signal types.

The company installed a **dataTaker DT80 Intelligent Universal Input Data Logger** into a system built around the new device to capture and display all of these parameters simultaneously for 4 different pumps. Appropriate sensors were selected for the parameters of interest and easily interfaced to the data logger:

To measure water flow, a standard “turbine” system flow meter was selected based on the expected flow rate. This meter had a small vane which rotated rapidly at a speed proportional to the flow rate, producing a pulse output that was then read with the high speed counter inputs of the DT80 and converted to flow rate using a scaling equation.

For recording the water pressure, an off-the-shelf pressure sensor was chosen. The sensor provided a voltage output proportional to the pressure and much like the flow meter above, this could be converted to the correct units using the built-in scaling of the data logger.

The 3 electrical parameters--voltage, current and power--were all monitored using a multifunction energy meter with a serial output. The energy meter had an RS485 interface allowing multiple devices to share the same 2 wire communication bus. When queried, the meter responded with a long string of data containing all of the measured parameters. In operation, the dataTaker datalogger sent a request command to each meter, read the returned data string, and parsed out the data of interest.

Finally, turbidity meters were used to monitor the cleanliness of the water. These devices provided a simple 4-20 mA current output proportional to the turbidity. This current was passed through a 100 ohm

shunt resistor to generate a voltage which was then read by the data logger and scaled to the appropriate units.

The DT80 data logger featured analog and digital channels, high-speed counter inputs, phase encoder inputs and programmable serial sensor channels to easily connect to most sensors and data measurement sources. Almost any physical value including temperature, voltage, current, 4-20mA loops, resistance, strain gauges, frequency, and more could all be scaled and logged. Users captured detailed test readings using the logger's 5 to 15 universal analog sensor inputs and 12 digital channels. The intelligent data logger could store up to 10 million data points in user-defined memory, with independent control of schedule size and mode to log only as long as needed. The DT80 also archived data on alarm event for maintenance purposes, copying to USB memory and transferring via FTP if needed.

The stand-alone, low-power data logger featured a built-in display, 18-bit resolution, and dataTaker's renowned durability and construction. Communications features included RS232 with modem support, USB, Ethernet and USB memory stick ports for connection to the DT80 locally, remotely or over the Internet. The web interface allows users to configure the DT80, access logged data and see current measurements as mimics or in a list using a web browser.

Additionally, dataTaker dataloggers included free built-in dEX software utilizing an intuitive graphical interface enabling users to configure the data logger, view real-time data in mimics, trend charts or tables, and retrieve their historical data for analysis. The software ran directly from a web browser and could be accessed locally or remotely, anywhere that a TCP/IP connection was available including worldwide over the Internet. Operators could use any of the logger's built-in communications ports to view dEX including Ethernet, USB and RS-232.

While this application required the measurement of several very different types of parameters, the flexibility of the DT80 data logger in accepting different physical values allowed a complete system to be built very easily--all of the data was made available through a single platform. The intelligent datalogger's ability to record data allowed for comparison of various filter materials and designs to determine which configuration provided the best combination of performance and energy savings. The included dEX software made configuration easy and proved suitable for both novice and experienced users.

For more information on the DT80 Intelligent Universal data logger, other dataloggers in the highly successful dataTaker line, 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.

Contact Information:
CAS DataLoggers, Inc.
12628 Chillicothe Road
Chesterland, Ohio 44026

CAS DATALOGGERS

(440) 729-2570
(800) 956-4437
sales@dataloggerinc.com
http://www.dataloggerinc.com