Fruitful Partnerships

A unique partnership allows a water district to upgrade to SLCs and Modbus communication modules to monitor power usage.

by Danetta Bramhall, Staff Writer, ProSoft Technology

Due to its climactic diversity and geographical contrasts, California has always been faced with the problem of how best to conserve, control and move water. While the northern part of the state, with its alpine forests, receives as much as 100 inches or more of rain per year, the central and southern parts of the state range from arid desert to fertile farmland with some areas receiving less than 2 inches per year. That means population centers are often in locations where there is not sufficient water supply.

One of those areas is California's fertile San Joaquin Valley. Here the Cawelo Water District, part of Califorina's State Water Project, supplies irrigation water for over 45,000 acres of crops including grapes, citrus, almonds and pistachios. Cawelo's outdated control system suffered reliability problems and parts were no longer available for the legacy system. In

On the Web

Alllen-Bradley SLCs: www.ab.com/plclogic/slc.html • *PanelView 550:* www.ab.com/eoi/graphicterminals.html
ProSoft Technology: www.prosoft-technology.com

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addition, the buried wire was degrading fast.

To solve the problem, Cawelo turned to an Allen-Bradley SLC/ProSoft communication module combination that allows remote control of facilities, monitors power usage and quality, and enhances the district's ability to perform load shifting for remote facilities. To accomplish the upgrade, Cawelo turned to Prousys Inc., a systems integrator based in Bakersfield, Calif.

A name-brand solution

Prousys Inc. has been helping its clients to improve productivity and quality in the water/wastewater, oil and gas, food processing and pharmaceutical industries for more than seven years, and they were familiar with the needs of the farming community in Central California.

"This project started with a call from the water district complaining of buried wire that was degrading, the inability to find spare parts and a general level of reliability that was not acceptable," says Danny Burns, operations manager for Prousys. "The water district needed a name-brand solution with local support. So we recommended Allen-Bradley hardware."

Allen-Bradley SLC processors were installed to replace the aging Westinghouse PLCs at each of the five remote well sites. Multilin PQM Power Monitors provide metering for current, voltage, real and reactive power, cost of power, power factor and frequency. To monitor power usage and detect anomalies in the Multilin PQM Power Monitors, a ProSoft Technology Modbus Communication Module (3150-MCM) was installed in each processor.

The 3150-MCM Modbus Communication Modules are single slot, backplane compatible solutions for the Allen-Bradley 1746 platform. Operating control is accomplished using simple ladder logic and data table configuration. The only software necessary is a standard ladder programming package. The two Modbus ports are configured independently, allowing the module to operate as a master or slave.

"This is a perfect example of how ProSoft modules are used everyday to connect Allen-Bradley hardware with other networks," says Scott Sibenac, regional sales manager for ProSoft. "We receive numerous requests on a daily basis for modules in the water/wastewater industry. Because our modules are designed to be used as in-rack solutions for Allen-Bradley processors, it is a cost-effective way for plant managers to use their existing Allen-Bradley equipment with other network's protocols."

Prousys also installed a SCADA

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Master Control system consisting of an Intellution Fix/DMACS HMI and an Allen-Bradley SLC 5/05 with two ProSoft DF1 Communication Modules. This polls all of the five well sites, three pump stations, four reservoirs and five check stations via a Data-Linc SRM6000 Radio and LLM-100 Modem.

The DF1 Communication Modules are also single slot, backplane compatible solutions for the Allen-Bradley SLC platform. The two DF1 ports are configured independently, allowing the module to interface to two separate physical networks. Once configured, the module will perform all protocol related functions on a stand-alone basis.

Since redundancy is a key factor in most water systems, Prousys installed and configured a second HMI to provide control redundancy. In the event of a failure in the primary controller, the system switches to the backup, ensuring seamless control in the plant. "In other words," states Burns, "the system will keep right on running if the HMI goes down."

The system's three pump stations, containing pumps ranging in size from 500 hp to 1,000 hp, are controlled according to the levels in the associated wells. The precise operation of the system depends on the accurate measurement of system levels and flows across the entire water system. Flow and level meters relay these measures back to the central control room for monitoring and control. Monitoring can also take place at each individual pump station through **Allen-Bradley PanelView 550s**.

"The new system now gives the water district full control of all remote sites," says Burns. The SCADA system can now track station flow rates, overflow events, well level, in-flow and out-flow. They also have the capability to detect numerous system failures including power, high/low voltage, phase imbalance, high/low amperes, frequency, load factor and low water level.

"Since the ProSoft modules communicate over the backplane with the Allen-Bradley processors, they were critical to the success of this project," adds Burns. "ProSoft provided the missing link in the communication chain, seamlessly allowing connectivity between these differing networks."

New reservoirs and wells are still being added to the system, all using the Allen-Bradley/ProSoft Technology solution.

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