



By John K. Collings

Hybrid SCADA

In the last four years, there have been dramatic changes in the use of cellular services for SCADA telemetry. Nationwide high-speed data services have been deployed by all major carriers, which now provide coverage virtually anywhere there are population centers. As cellular to Web-based services have gained popularity and acceptance, some utilities have had to choose between traditional SCADA and CCWD SCADA.

Success at trying to mix the two telemetry options has been limited. Off-the-shelf cellular data modems have not proven the most adept for use with PLCs and polling routines found in most traditional SCADA systems. Although they can work well for scheduled intermittent data downloads, users have found them ill-suited for continuous data connections.

COMBINING CONVENTIONAL AND CELLULAR SCADA YIELDS INCREASED PERFORMANCE AND BIG SAVINGS

This problem has been addressed by developing cellular remote telemetry units (RTUs), which push data as it happens. They are specifically designed to recover from normal, momentary interruptions inherent in cellular networks. In addition, custom private network connections with national cellular carriers greatly reduce interruptions encountered by typical cellular data service subscribers. These private data "pipes" keep data secure, encrypted and off the public Internet. They also provide a bypass in the network to reduce the likelihood of bottlenecks.

These custom links are expensive and involved to set up; only the largest utilities could consider them. With CCWD SCADA manufacturers spreading the cost across hundreds of customers and thousands of field devices, it becomes far more economical.

The Hybrid System in Action

The city of Tuscaloosa, Ala., recently installed a large in-plant and field SCADA system that covers four water and wastewater treatment plants and more than 100 remote pumping stations. Besides being a very large SCADA project, this project is unique in that it is the first in the country to mix cellular/Web SCADA with traditional radio RTU to central HMI computer SCADA. By mixing the two SCADA technologies together, the estimated costs of the project were reduced by about 25%.

"When using traditional radio and land lines, the estimates from integrators and engineers was in the \$6 to \$6.5 million range," said Jimmy Junkin, director of Tuscaloosa's wastewater system. "After testing the cellular RTUs at several of our most challenging (and expensive) sites for over a year, we directed the project engineers to re-estimate the project using the cellular RTUs where applicable."

The city and engineers chose to use cellular at the low-to medium-flow duplex pump stations, supervisory monitoring water sites and the sites most costly to reach. "Frankly, we didn't expect the cellular-based equipment to work very well. Some of our previous experiences with cellular haven't been that good," said Bill Phillips, senior I&C engineer with CH2M HILL in Gainesville, Fla. "After the successful testing, and considering the way it simplified numerous areas of the project, we were much more comfortable designing the cellular into the system. We're always looking for new ways to save our customers money."

Cellular-based RTUs were specified for 48 of the 117 remote sites. Curry Controls of Lakeland, Fla., submitted the winning bid of just under \$4.5 million. "Though it was out of our specific area of responsibility, we had questions about building this hybrid system. We had just never done a project this way before. But we are pleasantly surprised with the ease of integration and performance of the system," said Milton Weaver, Tuscaloosa project manager for Curry Controls.

Recent Progress

Cellular-to-Web manufacturers now make products from basic wireless dialers to streaming data RTUs with sophisticated yet simple software. SCADA system data and graphs are available in the field, directly from a Web-enabled cell phone. Some cellular-to-Web SCADA manufacturers have developed to the point that they now offer turnkey solutions for integrating their products and services into traditional SCADA systems. They can guide engineering firms, integrators and customers through the process from design to startup. The results are a high-performance system that is simple to use and savings from hundreds of thousands to millions of dollars.

Hybrid SCADA is becoming more widely accepted even though it is not appropriate for every application. The targeted nature of cellular collected to Web-delivered systems, combined with their ease of integration into traditional SCADA systems, allows for substantial cost savings while gaining user-friendly features that save more money. www

John K. Collings is president of Mission Communications. Collings can be reached at 678.969.0021 or by e-mail at johnk@123mc.com.

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