

RTU SCADA system replaced by open PLC solution

Introduction

This application highlights the classic differences between a proprietary RTU SCADA solution and an “open” PLC solution. This customer is a small rural utility that was looking to upgrade their water system to eliminate annual service fees and difficulty in getting spare parts that they were experiencing with their existing system. The Systems Integrator has experience with RTU Systems and many PLC systems in water applications and was instrumental in convincing the utility and their consulting engineer of the merits of an open system.

Application

The system consists of a main water plant with 13 remote well and pump station sites. The existing communication system used leased phone lines and the client wanted to maintain them. It was advantageous to retrofit the controls in the existing cabinets in most cases to keep the installation cost to a minimum. The existing RTU system was becoming more expensive and increasingly more difficult to keep in operation. They also wanted to maintain control at each location even if the communication lines went down to that site for whatever reason. There was a SCADA software package upgrade that was included on the system that also needed to be more up to date and open.

Objective

The water company's main goal was to procure a system that would cut their annual maintenance costs significantly. A system that could be serviced internally, that provided the flexibility for easy modification or expansion, that had a software package that could be adapted to the many reports that they needed and would be reliable. They also wanted to retrofit as many of the field devices as possible to keep the total cost down. They had a very tight budget to live with.

Solution

The solution was provided by a Modicon Quantum 140CPU43412A Hot Standby system at the main plant. This provided the reliable, powerful, and open control system they needed as the main front end. Each of the remote sites had a Modicon Momentum CPU with 1 to 3 I/O bases depending on the requirements. The communication network consists of Quantum Ethernet modules communicating to the SCADA computer and through an Ethernet to Modbus bridge. The bridge then connected to the Lease Line modems via an RS485 network. TCP/IP MSTR Function Blocks were used to poll the remote sites at a rate that was faster than the specification required. The option for the use of report by exception from the remote sites was left open for future use. The Schneider Electric products provided standard PLC products that are readily available and will be supported for years to come. The open Modbus and TCP/IP Modbus communication protocols allowed the use of standard Ethernet and serial



INDUSTRY

Water / Wastewater

OBJECTIVE

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SOLUTION

Modicon® Quantum™ PLC
Modicon Momentum™ PLC
Modbus® Bridge

BENEFIT

- Remote sites will continue to control local I/O even if the Lease Line communication is lost
- The update time of the network improved by 700%

devices and modems. All of the programming and configuration is done using conventional PLC languages and SCADA software tools.

Benefits

Some of the benefits of this application include:

- Increased reliability of the system due to the redundant Modicon Quantum PLCs and the redundant SCADA Computers.
- Each remote site will continue to control its local I/O even if the Lease Line communication to that site is lost.
- The update time of the network was reduced from 15 minutes to less than two minutes. This is a 700 % improvement.
- The report package of the CiTech software meets the current demands of the EPA without any custom configuration.