

Water Supply System

Keywords: D2 W MIO-1; analogue inputs; analogue outputs; pulse counts; flow meters, remote control; SCADA; wireless telemetry.

Introduction

A rural Water Supply Authority was able to both create efficiency gains and reduce operating costs by distributing its treated water utilizing Crouse-Hinds D2 W MIO wireless I/O products.

Historically, this rural water supply authority had relied on timer based pump controls, with daily site checks by maintenance and operations personnel to maintain treated water supply to its network of elevated tanks and towers.

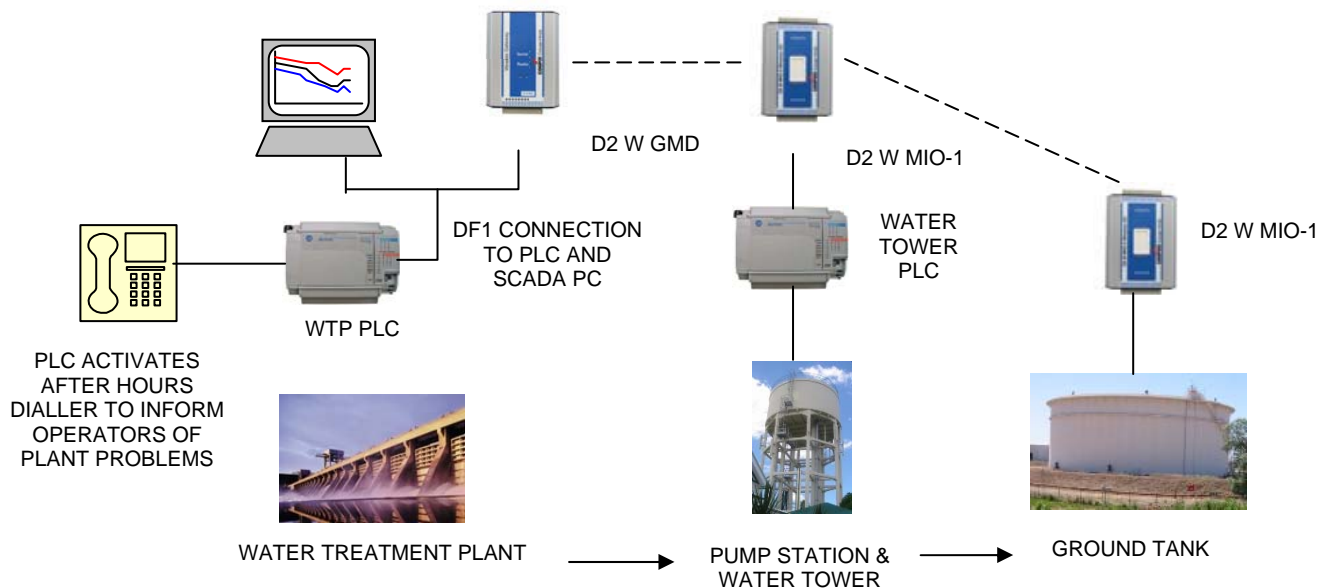
Population growth in the area had resulted in several problems including:

- Under or over supply of treated water from variations in demand
- Excess use of staffing to control the water supply, particularly after-hours
- Inability to automatically allocate pump run times to the most cost effective energy tariff, resulting in excessive power costs
- Lack of long term information for future planning.



Solution

The solution involved installing Crouse-Hinds wireless I/O units and level transducers at existing tanks, water towers and pump stations, and a SCADA based control system located in the Water Treatment Plant. Existing PLC's at the WTP and pump stations were re-used.



The SCADA software allowed operators to control and display plant status such as tanks, pumps and valves in operation. The PLC's were able to automatically control tank level based on demand and power tariffs. Moreover, the trending and reporting features of the SCADA package enabled plant engineers and management to analyze data to optimize tank/tower water level efficiencies and in the process reduce operating costs. After-hour faults were detected by the WTP PLC and alarms are sent to the operators by an alarm dialler to indicate the problem. The vital linkage back to the control room SCADA application was provided by Crouse-Hinds D2 W MIO wireless I/O units.

Installation

Ground tanks and elevated water towers were fitted with D2 W MIO-1 wireless I/O units and level sensors - an analog transducer for measuring level and level switches for extreme high and low level. These signals are transmitted by the D2 W MIO units to pump stations and the SCADA site.

D2 W MIO-1 units are also connected at pump stations and connected to existing PLC controls. The SCADA application was able to monitor pump operation and fault status.

The D2 W MIO wireless modules at the tanks transmit directly to the associated pump station - transmission via the WTP is not necessary. Equipment failure at the SCADA site does not interrupt control of the pumps. Each wireless unit provides a "failure" output - this allows the pump station PLC's to continue operating on "local" control, until the fault is rectified.

Outcome

As a result of the installation, the water authority was able to achieve significant direct and indirect benefits. These included:

- Increased efficiency and a reduction of energy costs from efficient allocation of water to towers/tanks and allocating pump run times to cheapest tariff rate.
- Remote switching and pump monitoring dramatically reduced the number of man-hours needed to daily monitor pump, tank and water tower operational effectiveness.
- Historical plant information allows long term plans to be better prepared.
- Improved tank management eliminated EPA and general public dissatisfaction.