

# Complete SCADA Connectivity for Fairborn Water



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- ADAM BARHORST  
P.E., SCADA/SYSTEMS  
INTEGRATION  
MANAGER, ELECTRO  
CONTROLS.

## Overview

**THE WATER AND WASTEWATER FACILITY IN** Fairborn, Ohio serves 30,000 residents in the surrounding area. In service for decades, the facility maintains high quality standards while optimizing operation efficiency. These efforts enable them to provide safe water at reasonable costs. As the population continues to grow and demands for monitoring and efficiency change, plant operations need to understand how new technologies can be implemented to improve service.

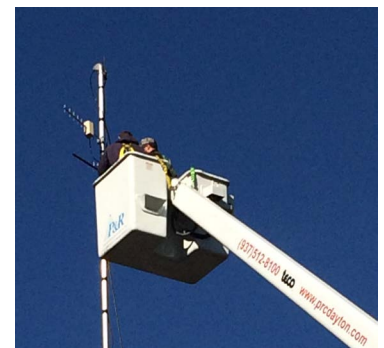
## Challenge

**MAINTAINING CLEAN AND SAFE DRINKING WATER** requires constant measuring of multiple levels from across the water treatment plant, and making required adjustments in a timely manner. Automating the measurement and control processes with Supervisory Control and Data Acquisition (SCADA) systems is an obvious choice, and wireless technology is the most cost effective solution that has been deployed. Being located near an Air Force base, the number of wireless emitters have grown over the years, limiting available spectrum.

Fairborn Water needed a reliable wireless system that would meet their communication needs. They contacted P&R Communications, a wireless communications solution provider serving the Dayton area for 50 years. For complete systems integration, they collaborated with Electro Controls, a Systems Integrator in Sidney with more than 40 years’ experience.

## Requirements

“FAIRBORN WATER HAD BEEN USING THE UNLICENSED spectrum for years,” said Shawn Suppa, Territory Account Manager, P&R Communications. “Over time, the unlicensed frequency bands have become crowded and noisy, which can cause inefficiencies or even brief outages.



We advised them to operate a parallel network in the private-use licensed frequencies to keep from combatting traffic in the unlicensed frequencies.”

A comprehensive review of the existing communications network revealed that many of the communication points were equipped with a serial port for access, but did not support an Ethernet port for modern data collection and control communications. These systems were reporting on pump levels, water levels, and control functions – the valuable information needed at the control center.



## Solution

### P&R USED THE FREE LINKPLANNER SOFTWARE FROM CAMBIUM NETWORKS TO DESIGN A WIRELESS NETWORK

that will meet the needs of the Fairborn Water district. LINKPlanner uses the exact GPS positions of the equipment to model and predict the performance of the radio system in the exact location.

From the aggregation point tower location, the system reaches out to remote nodes four miles distant when a clear Line of Sight (LoS) is available. Given that some of the nodes are located in areas with dense trees and other obstructions, the range for these Non Line of Sight (NLoS) links is about 2½ miles.

“LINKPlanner is really helpful compared to other open source software,” says Suppa. “LINKPlanner does a great job of visualizing performance with a GoogleEarth overlay. It also gives us detailed installation reports, providing the exact azimuth and antenna tilt needed at each end. With this system, there is no guesswork, and there are no mistakes.”

Once installed, the cnMaestro™ management system provides a birds-eye view of the wireless network. The system provides end-to-end 24/7 monitoring of the communications network, with immediate notification of any problems or degradations.



cnReach™ Narrowband Solution	
Frequency	220, 450, 700 and 900 MHz licensed and unlicensed frequency bands
Security	AES 128/256-bit encryption with password authentication
Interfaces	Extensive I/O capabilities easing the transition from serial to all-IP networks with multiple serial ports, Ethernet ports and analog/digital I/O built-in



“The design and implementation of the cnReach network was painless. We enjoyed ease of installation and operation, with sites taking 2-3 hours to complete. Being able to operate on ISM while we waited for the MAS licensing to complete was a great advantage.”

-Mitchell Davis, Wireless Engineer, P&R Communications

## Results

**“I HAVE BEEN WORKING WITH THE CITY FOR OVER TEN YEARS MAINTAINING** and upgrading their SCADA system, and the time had come to overhaul their remote telemetry units,” said Adam Barhorst, SCADA/Systems Integration Manager, Electro Controls. “I was tasked by the City to vet out and propose different solutions for them to review. I presented a couple different options, but it became obvious to both the City and myself that Cambium’s cnReach radios, coupled with P&R Communications expertise in deployment was the right choice.”

