

Water and wastewater management

# Wireless solutions for water and wastewater management



Flexible, cost-effective,  
integrated solutions  
for control and monitoring





# Global market leader for wireless solutions in water and wastewater

ELPRO is a leading global supplier of industrial wireless solutions for water and wastewater.

## Industry leader

For more than 30 years, ELPRO products have provided complete wireless monitoring, control, and networking solutions for the water/wastewater industry. We are the global market leader in water/wastewater wireless solutions.

We help water district professionals use wireless to upgrade their aging infrastructure and realize cost savings associated with reduced manual labor and increased efficiencies.

Reliable and secure ELPRO industrial wireless products help protect your water resources. At water and wastewater facilities, wireless radios monitor critical data, including tank levels, temperatures, and pressures, and provide pump control.

Wireless monitoring in the distribution system can pinpoint or prevent leakage.

## Comprehensive water/wastewater solutions

We provide a comprehensive water/wastewater solution with a SCADA (Supervisory Control and Data Acquisition) system, ELPRO wireless radios and wired Ethernet switches, and a network management system. Wireless I/O and repeater functionality provides a flexible, low-power, integrated solution. Real-time monitoring over extended distances records key data points and can instantly indicate faults.

ELPRO monitoring solutions can help you comply with government environmental reporting requirements.

Network management software keeps you on top of your operations.

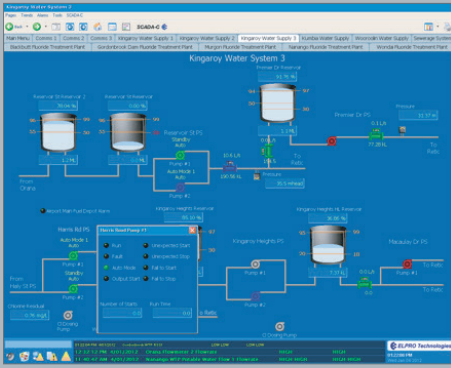
## Service and Support

Our industry-leading expertise and field-proven technologies deliver innovative wireless system solutions.

With extensive industry experience in global deployments, our approach can provide support in network upgrades or deliver a turnkey solution. We offer a broad range of services, from feasibility studies, site surveys, and system design to implementation and commissioning.

Our flexible, cost-effective, integrated solution for water management is easy to implement and keeps you in control of your assets.





A fully integrated solution with a SCADA system, network management system (NMS), wireless radios, and wired Ethernet switches provides a communications backbone for your water and wastewater management operations.

## A comprehensive water/wastewater solution

**Proven solution**  
Local water utility uses ELPRO products to upgrade infrastructure and link pump stations

### Problem

Due to increased demand on its existing infrastructure, a local water utility needed to upgrade and expand its overall control and monitoring system. Consisting of leased telephone lines, the system was expensive and had reliability issues. Operators lacked real-time visibility and were often forced to control pump stations manually to meet demand.



### Solution

The utility upgraded to a highly reliable and scalable solution, replacing its SCADA system, ELPRO network management system (NMS), and leased-line network with long-range, meshing wireless ELPRO Ethernet modems and Ethernet switches. The modems provided both serial and Ethernet connectivity to interface with existing serial PLCs and newly added Ethernet-enabled PLCs. The addition of Ethernet switches also enabled operator panels and allowed Ethernet-enabled cameras to be added to the network. The NMS provided real-time network and diagnostic monitoring that enabled preventative measures and reduced downtime. Installation and commissioning of the solution was straightforward and simple.

### Results

Wireless ELPRO Ethernet modems adapt to any type of network topology, self-heal, are reliable, and allow for future expansion. Remote diagnostics meant technicians could measure performance and pinpoint problems from the NMS. An integrated solution of SCADA, NMS, wireless radios, and wired Ethernet switches fulfilled the critical monitoring and control needs of the district. With a reliable communications system in place, the utility saw immediate cost savings.

ELPRO can help you design and implement a world-class wireless network customized to meet unique facility needs

# Benefits

## Wireless benefits

- Optimizes response times and immediately indicates critical diagnostic information
- Improves monitoring and control of water flow over extended distances
- Improves operator safety and efficiency by eliminating the need to travel to remote site locations for readings
- With wireless radios, allows for any type of network topology, can self-heal, and provides reliability as well as capacity for future expansion
- Reduces costs for manual labor and maximizes efficiency
- Simplifies installation and commissioning of network with reduced infrastructure required
- Provides enhanced reliability through a flexible network topology that can self-heal, while easing future expansion

## Wireless monitoring and control applications

Water authorities use wireless solutions for a variety of applications:

- Pump station control
- Water quality monitoring
- Dam gauging and gate control
- Treatment plant PLCs and other devices
- Large network SCADA systems
- Leakage detection in distribution networks
- Early flood-warning systems
- Valve and flow meter stations
- Rainfall monitoring
- Tank level monitoring
- Ethernet camera surveillance
- Irrigation monitoring and control
- Alarms: Wet well overflow, intruder, and others





# Wireless product portfolio

“The use of ELPRO telemetry modules made the design and implementation of the SCADA system easier and quicker due to its technical characteristics and ease of configuration and operation. We will continue to automate of the rest of the water system and use ELPRO telemetry equipment.”

José Baudelio Zamora Lopez, Electronic Engineer, Automation Coordinator, SAPAL, Mexico

## Information: Monitor and optimize



Control System



Data Acquisition System



Network Management System (NMS)

## Controller: Integrate and extend



Gateway  
400/869/900 MHz

### Gateway



Gateway  
340-480 MHz



Mesh  
869/900 MHz

### Mesh



Modem  
340-480MHz

### Ethernet



Modem  
2.4/5.8 GHz



Ethernet Switches



Modem  
Quad Band

### Cellular

## Machine: More throughput and uptime



Mesh  
869/900 MHz

### Mesh



Mesh  
2.4 GHz



Modem  
2.4/5.8 GHz

### Ethernet



Modem  
340 - 480 MHz



Modem  
869/900 MHz



Modem  
150/220/400/869/900 MHz

### Serial products



Modem  
Quad Band

### Cellular

## Sensor: Smarter diagnostics



One Way  
869/900 MHz

### I/O products



Multi I/O & Gateway  
340-480 MHz



Mesh  
869/900 MHz & 2.4GHz



Multi I/O & Gateway  
150/220/400/869/900 MHz



Expansion



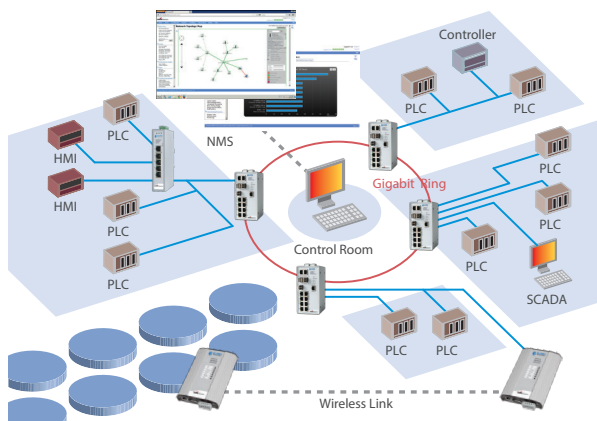
# Solutions delivered

Reliable and secure wireless solutions provide more effective monitoring and control, improving asset management and streamlining operations



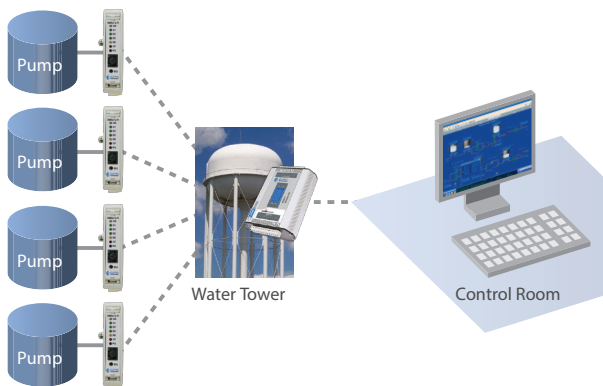
## Water district infrastructure upgrade

A water district needed to upgrade their infrastructure to include modern SCADA monitoring and control capabilities due to cost and reliability issues. As part of the upgrade, PLCs using Profibus® protocol are specified at each pump station. Mated to the PLCs is a serial data wireless modem. Wireless radios allow for any type of network topology, can self-heal, and provide reliability in addition to a capacity for future expansion. Installation and commissioning of the radios is easy. Back at the control center, cost savings were immediately realized through reduced labor with a reliable communications system; in addition, remote diagnostics allowed technicians to measure performance and pinpoint problems before visiting a pump station.



## Water/wastewater long-distance monitoring

A large metropolitan city needed critical real-time monitoring of a public water/wastewater system over long distances. The distributed PLCs that collect information from a variety of devices at remote sites communicate with the central SCADA by using a combination of ELPRO industrial wireless Ethernet radios and switches. In addition, the network management system (NMS) provides monitoring of the entire network. The complete solution of NMS combined with wireless and wired Ethernet products fulfilled critical monitoring needs while providing the city with long-term cost savings.

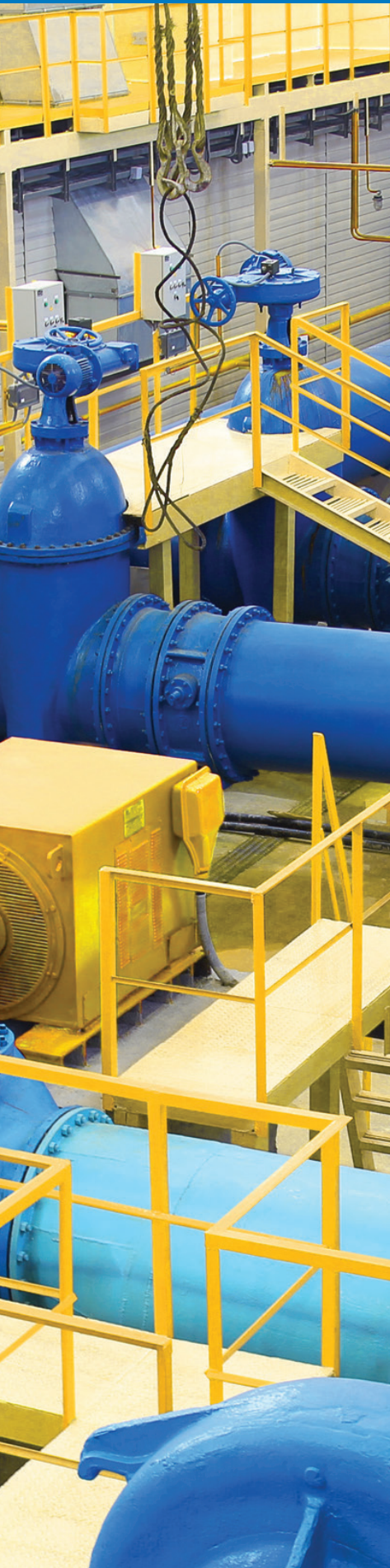


## Pump station alarm monitoring

A local authority wanted an online monitoring system for failure alarms on pump stations. The pump stations had been fitted with local alarms; however, if these were ignored, sewage overflowed, resulting in environmental complaints. ELPRO industrial wireless I/O units were installed as a cost-effective solution. Pump run and fault status and wet-well overflow status can now easily be transmitted back to a central computer. An online monitoring is in place, and the intelligent network functionality in the wireless units allows for each pump station to transmit only as far as the nearest pump station, negating the need for expensive mast and antenna installation.



# Applications



## Water flow and fluoridation solution

**Problem:** A regional water council covering 3243 square miles needed to control the water flow for their bulk water supply and wastewater systems.

**Solution:** ELPRO designed and implemented a telemetry and SCADA system for the council. The system used ELPRO TLX-400 radio telemetry units for the communications and the ELPRO SCADA-C/Citect for the SCADA. A comprehensive telemetry system was also implemented for the fluoridation plants at towns throughout the region, fulfilling extensive critical monitoring needs.

## Hydroelectric dam traffic management

**Problem:** The Tennessee Valley Authority (TVA) operates 29 hydroelectric dams along with many other types of power generation facilities. At one such dam there is an inclined elevator used to transport personnel between the base and top of the reservoir. The elevator used a cable bus system to send commands to and from the car and motor. This cable system broke down and the elevator had been inoperable ever since. This meant maintenance and engineering staff had to drive around—a three to four mile journey. If one small tool was forgotten, the expense in labor time and mileage would be quite high compared to one quick trip in the elevator. The cost to replace the cable system was estimated to be \$16,000.

**Solution:** A wireless alternative was introduced which consisted of two 905U-1 multi-I/O radios, dramatically reducing the equipment cost and installation time. Maintenance staff loved the convenience of the quick transportation system between the top and bottom of the dam.

## Automation, monitoring, and control of major water utility

**Problem:** The water utility office (SAPAL) of the city of Leon, Mexico is a noncentralized organization that supplies the city with drinking water and drainage. Leon is the biggest and most important city in the state of Guanajuato located in the central part of Mexico and has a population of 1,300,000 inhabitants. Leon's SAPAL has 106 water wells, 9 water tanks, and 19 pumping sites. These water supply sources are found grouped into seven main conduction lines. Some of the installations had a basic start and stop remote control, but basic information like the amount of water extracted, the electricity consumed, and the functional situation of the equipment is gathered by scheduled personnel visits, at installations located far from the city and in places that are difficult to reach.

SAPAL wanted a more efficient and modern operation, including a monitoring and control system that would report the condition of the wells, water tanks, and pumping sites in real time. They also wanted to control and monitor distant installations from a control room, accessing information about production efficiency and costs through the local intranet.

**Solution:** After analyzing several options, ELPRO telemetry equipment was selected, since it had all the needed requirements to guarantee easy design, installation, operation, and maintenance of the SCADA system. The technology upgrades brought about a dramatic modernization of the facility, resulting in increased efficiency and savings of both time and money. The Leon SAPAL is now considered one of the leading organizations in the state of Guanajuato.



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