RL RED LION™
a spectris company

ABOUT QUANTUM

Quantum specializes in delivering professional engineering and automation control system services for the industrial and commercial manufacturing facilities. The company offers consulting, engineering solutions, inspection services, instrumentation and controls (I&C), SCADA (Supervisory Control and Data Acquisition) applications, and various automated programming.

QUANTUM
ENGINEERING | DESIGN | AUTOMATION | SCADA

CUSTOMER

Quantum

QUANTUMENGR.COM

LOCATION

Tempe, AZ

CHALLENGES

▲ Unreliable wireless communication system

▲ Unable to properly remotely monitor RTU cabinets on an 11-mile water pipeline

▲ Aging infrastructure

RESULTS

▲ Municipality transitioned from 900MHz wireless network to 4G

▲ Reliable communication infrastructure deployed to monitor pipeline

▲ Made possible with multi-carrier cellular RTU with GPS and control

PRODUCTS

INDUSTRIAL NETWORKING

RAM® 600 Cellular RTUs

DEFINITION OF
PROBLEM

Quantum works with many industrial sectors, such as mining, energy production, and wastewater, which often have challenges with geographically remote locations. No matter how remote, these industries depend on constant communication. For many years the solution has been unlicensed wireless radio equipment either connected serially or via the Ethernet.

With the emergence of Ethernet-connected devices, certain wireless frequencies, including 900MHz radio communication, cannot support high-speed and high-bandwidth Ethernet traffic. These radios can only achieve a maximum data rate of 1024 Kbps, extremely slow compared to Wi-Fi (802.11) and 4G LTE data rates. The slow data rate could cause delayed communications, some of which could be urgent like alarms, supervisory commands, and more. The challenge is further complicated by repeater radios, inefficient PLC messaging schemes, flat networks, and excessive polling rates.

This scenario is not ideal for critical applications that control and monitor equipment remotely. These limitations needed to be corrected by transitioning to 4G LTE or Wi-Fi wireless networks for a new, more robust wireless communication infrastructure.

For this specific project, a municipality operates an 11-mile pipeline, which crosses two other cities to deliver water to a treatment facility. Four pump station RTU cabinets sit along the pipeline, controlling and monitoring the flow of water. To provide communications throughout the 11 miles, six 900MHz radios were in use to allow the individual RTU PLCs and water treatment plant to be in touch.

Since the initial communication process was put in place, urban growth has begun to affect the performance of the wireless carrier. Additional obstacles were also present, including a 650' elevation difference between the first RTU and treatment facility.

Inconsistent and unreliable communication made it almost impossible to control the four pump stations remotely. The communication issues were critical enough that it represented a significant risk regarding water production and delivery.

Quantum consulted with the city and recommended that the town move to a 4G LTE cellular network to communicate.

THE RED LION
SOLUTION

To enable the new communication system, Quantum needed to leverage the existing infrastructure while also infusing modern technology to solve the issues. This required the necessary 4G LTE equipment, working with a cellular provider, and deploying a new architecture.

Critical to this was the use of a multi-carrier cellular RTU with GPS and control. Red Lion supplied Quantum with a RAM® 6000 Cellular RTU. The RTUs have up to five Ethernet ports and a RS-232 serial port. It has a web-based event engine that can trigger built-in I/O or send SMS messages based on real-time data. The device was built to perform advanced control and communications for monitoring remote assets.

ADDITIONAL
EQUIPMENT
FEATURES

▲ Ability to change carrier networks vis software selection offering flexibility and an always-on connection

▲ Digital and analog I/O

▲ Cloud connectivity for reliable and scalable communications

▲ Easy to configure (no need to know programming languages)

▲ Pre-defined alarms

▲ Robust security such as VPN tunnels, port forwarding, stateful firewall, packet filtering, data encryption, and Access Control List (ACL)

RESULTS

Since Quantum implemented the new network, the city no longer has to worry about its aging and ineffective wireless radio infrastructure. They now have a dependable communication system that allows them to seamlessly monitor each RTU cabinet remotely. The city can now focus all its efforts on providing clean drinking water to its citizens.

RL
RED LION™
a spectris company

www.redlion.net
EXCELLENCE. REDEFINED.

Red Lion has been delivering innovative solutions to global markets since 1972 through communication, monitoring and control for industrial automation and networking - enabling companies worldwide to gain real-time data visibility that drives productivity. Red Lion is part of Spectris plc, the productivity enhancing instrumentation and controls company. For more information, please visit http://www.redlion.net