Sub-GHz Transceiver Enables Smart Water Meter

The Challenge

Integrating a high-performance, low-power transceiver into a smart metering solution that met demanding quality and regulatory requirements for municipal applications.

The Solution

With Si446x EZRadioPRO, Aclara is able to bring highly reliable connectivity and low power consumption to its utility meter transmission units.

The Result

An ultra-high frequency metering solution that provides insight and data analytics to help operators manage resources effectively.

Today's Infrastructure Challenges

America's utility providers are facing two daunting challenges: first, our aging infrastructure is beginning to show serious signs of failure and is overdue for an upgrade. Second, the effects of climate change are starting to make themselves known when it comes to energy consumption. Fortunately, innovative companies like St Louis-based Aclara are taking the lead in modernizing utility services. And like most other aspects of modern life, connectivity is playing an important role in this transition.

Using Smart Water Meters to Create Valuable Networks

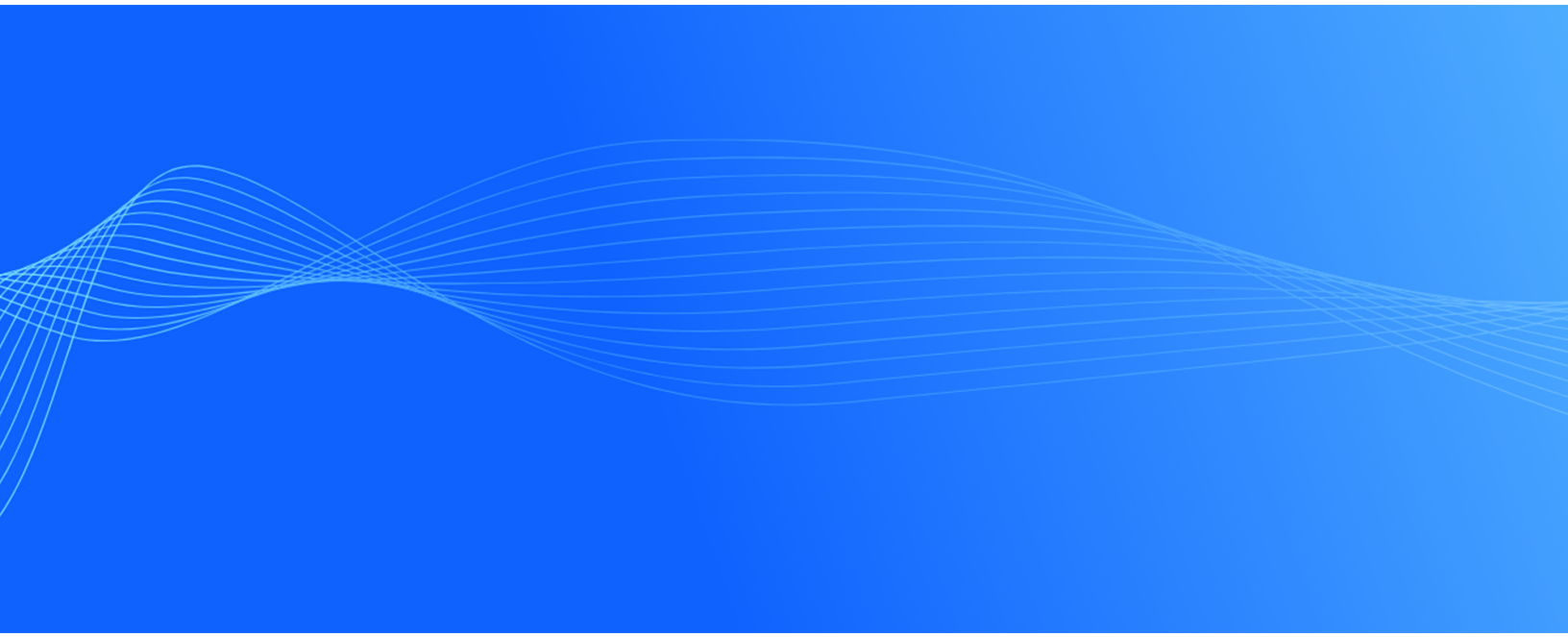
Aclara was founded in 2007 with a mission to build smart infrastructure solutions – it is now living up to its word with a solution that utilizes the ultra-high frequency (UHF) 450 MHz- 470 MHz spectrum and meter transmission units (MTUs) that connect to a variety of electric, gas, and water meters. Water utilities, in particular, are a focus for Aclara, so the company has developed a network that communicates from meter endpoints to the utility. The network is versatile because the data collectors that communicate meter data to the utility are installed in a variety of locations, including on buildings or utility poles.

The system provides full visibility and data insight so system operators can more effectively manage utility resources as supply and demand fluctuate. In addition to better management, the system helps utilities address issues quickly, so a small problem doesn't become a crisis. In water management, for example, leakage is a significant concern. In fact, there are cities in the U.S. where up to 30 percent of water is lost to leaks. Aclara's system takes on this problem in two ways: through data analytics and distribution network leak detection. After data is collected from meters, the utility can analyze it to determine whether a premise has a leak. Aclara customers, such as DC Water, use data analytics to determine if there's a leak in a home or business and notifies the customer.

The second piece is Aclara's leak detection system, which places acoustic sensors that "listen" to the sound of water in the mains and communicates that data to the utility over our AMI network. By analyzing the acoustic data, utilities can localize where a leak is - down to a meter or two.

Wireless Solutions Ideal for Smart Cities

Even with communication efficiency and leak detection accuracy, power was still a challenge as the endpoints need to stay in service for 20 years or longer – which is a lot to ask from an electrical component. So, finding a very low-power transceiver was necessary to make the system a reality. Silicon Labs' sub-GHz Si446X EZRadioPRO is the transceiver at the heart of the Aclara system, selected because of its combination of performance, low-power operation, and compliance with strict FCC rules, specifically Part 90 Mask D.



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