Keeping the Lights On

In-Place and Mobile Spectrum Monitoring for Public Utility Infrastructure

The public infrastructure we depend on for electricity, gas, and water was originally built many decades ago and is in need of upgrades and improvements. The electric grid, for example, still relies on outdated meters that require technicians to physically visit the location of the meter to manually check the reading. This is inefficient, costly, and lacks the granularity and accuracy needed for advanced analytics that can improve the way electricity is used and distributed.

In response to this problem, many utility companies are implementing thousands of smart meters across a wide geographic area. These meters connect to a wireless network and transmit data at regular intervals, often around 30 seconds. This gives utility companies access to real-time, accurate, and more detailed usage information, allowing them to bill customers more effectively, report on irregularities, detect fraud or theft, and improve profitability.

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The Challenge

Utility companies are increasingly depending on wireless networks to conduct remote meter reading and gain real-time situational awareness into energy infrastructure that is spread across thousands of endpoints and a large geographic area. These networks, which can leverage the unlicensed ISM bands such as the 900 MHz band, or licensed bands for private networks, can also make it easier to restore service after a blackout and integrate smart meters with other technologies such as battery storage, renewable energy sources including rooftop solar, and other key smart grid infrastructure.

The two main challenges for users are RF interference and compliance. RF interference can come from a number of sources, both malicious and inadvertent. For example, poorly insulated power lines and equipment, other radio transmitters, and connected devices can all interfere with critical energy infrastructure.

Utility companies must also be sure that they are transmitting within government regulations and are not disrupting other nearby transmitters through inadvertent signals.

RF Engineers at utility companies require a solution that can be used across deployment scenarios for both 24/7 continuous, in-place monitoring, and for mobile spectrum analysis and testing to locate inference and identify deficiencies in coverage areas.

The Solution

ThinkRF Real-Time Spectrum Analyzers offer the performance, portability, and flexibility needed to be used in a variety of deployment scenarios and signal environments. RF Engineers can deploy the networked and compact analyzers in a mesh, hub & spoke, or a hybrid architecture depending on their requirements.

Through a combination of stationary and mobile units comprising ThinkRF software-defined spectrum analyzers, powered by the ThinkRF P120 Vehicular Power Conditioner, RF Engineers gain continuous, 24/7 monitoring capabilities as well as the ability to conduct mobile spectrum analysis for source location and interference hunting applications.

For users who need to build a complete map of the signal environment and conduct time difference of arrival (TDOA) and power difference of arrival (PDOA) analysis, the ThinkRF R5700 Real-Time Spectrum Analyzer with GNSS synchronizes time and location information with signal information to enable more advanced analysis capabilities.

With a rich suite of ThinkRF APIs and Development Environments, RF Engineers can build their own application according to their unique needs.

Benefits of ThinkRF Solutions for Utilities Companies

Low size, weight, and power (SWaP) for easy deployment

Networked for remote deployment in a variety of network architectures

Best price-performance ratio available on the market

The Results

Utility companies are turning to smart meters to reduce the need for inefficient and manual readings, increase the granularity of the data they receive, and manage energy usage more effectively. With ThinkRF Real-Time Spectrum Analyzers, a rich suite of APIs and Development Environments, and P120 Vehicular Power Conditioner, utility companies can monitor, manage, optimize, and protect critical energy infrastructure in a complex and dense spectrum environment through in-place and mobile spectrum monitoring.

ABOUT THINKRF

ThinkRF is the leader in software-defined spectrum analysis solutions that monitor, detect and analyze complex waveforms in today's rapidly evolving wireless landscape. Built on patented technology and quality by design principles, the ThinkRF platform offers greater versatility, better performance and additional capabilities for 5G, monitoring, signals intelligence (SIGINT), technical surveillance countermeasures (TSCM), and test and measurement applications. Aerospace and defense companies, spectrum regulators and wireless communications providers use the remotely deployable, PC-driven and easily-upgraded platform to replace traditional lab equipment for wireless spectrum analysis.

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