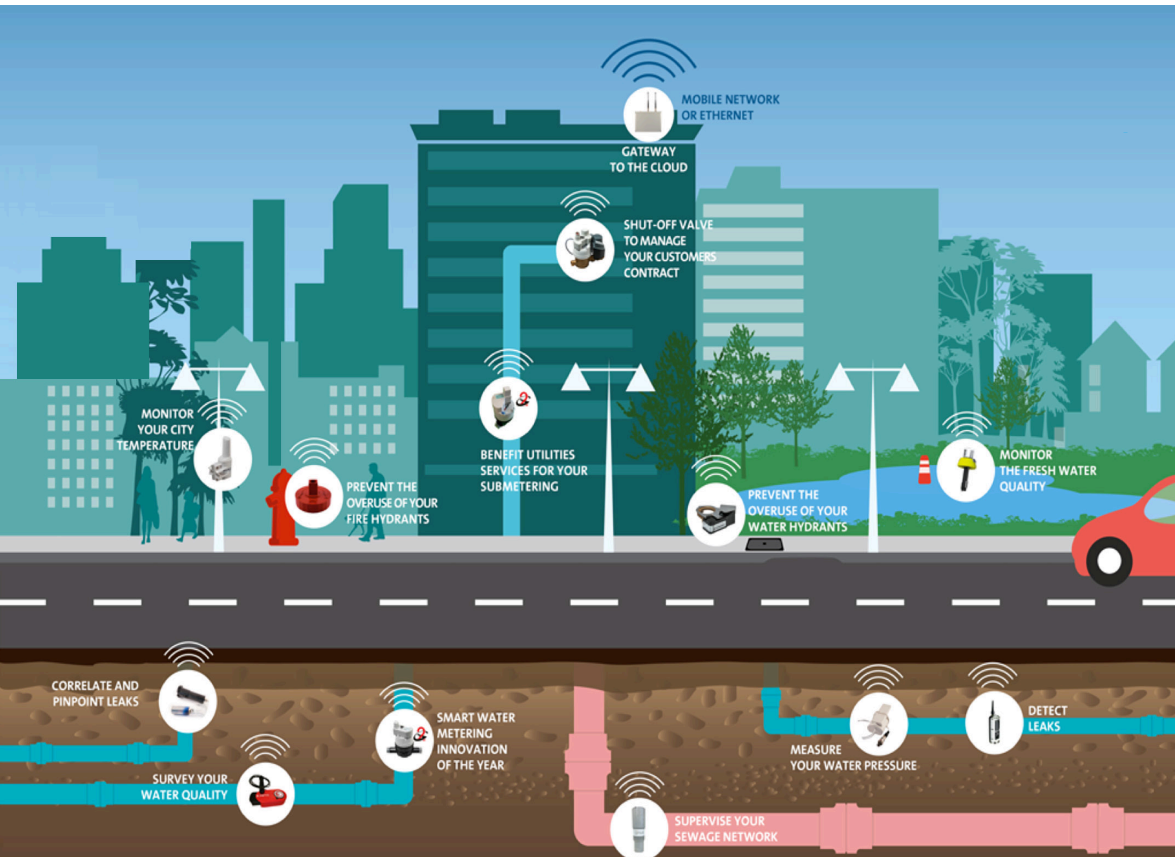


Leading the Digital Transformation of Water Utilities by Enabling Automated and Remote Meter Reading



Implementing a smart metering infrastructure allows utility companies to collect data faster and more efficiently. This white paper highlights Birdz, a leading provider of smart water metering solutions in France, and details how the company integrated Semtech's LoRa® devices and the LoRaWAN® protocol in its smart water utility deployments to increase operational efficiency and improve customer support.

Following the deployment of Birdz's LoRa-based water management system in 2015, the city of Lyon, France has identified and repaired 1,200 water leaks, achieved an eight percent increase in water network efficiency and saves an average of one million cubic meters of water annually due to the distribution network's improved performance.



FROM SENSOR TO ENVIRONMENTAL SERVICES

Unify all water sensors in a multi-services connectivity network to support the digital transformation of water utilities

THE DIGITAL TRANSFORMATION OF WATER MANAGEMENT

Historically, utility operations are laborious and require extensive measurement and action by field personnel. Industry leaders help water utilities stay responsive, lean and resourceful by deploying smart metering systems to replace outdated, labor-intensive processes. Additionally, utility companies are now able to lower costs and ensure a timely response to critical issues.

"A smart meter can simply index volumes of water for easy billing. It can also quickly detect all kinds of problems within a water supply network."

- Geoffroy Duplessis, Deputy CIO, Birdz



Research firm Informa Tech estimates the global smart water meter market will grow to eclipse \$2 billion by 2020.

The following are a few key market drivers and benefits of smart water management.



Remote Metering – Increases operational efficiency by wirelessly measuring usage data in dense urban environments, indoors and underground without the need to check each device manually, eliminating manual meter reading errors.



Reduce Waste – Monitors total water footprint at a granular level. Provides historical and real-time usage data that incentivizes utility customers to boost efficiency and accelerate sustainability efforts.



Leak Detection – Measures water pressure and flow through piping networks to detect anomalies and failure points instantly. From the water plant to the consumer, distribution networks can lose as much as 25 percent of water produced due to undetected leaks. Furthermore, drops in network pressure can turn leaks into entry points for dirty water.



Decrease Theft – Monitoring complete smart water networks, including fire hydrants and piping systems, provides instant alerts of security breaches. Rapid notification and quick response eliminate waste, reduce cost and decrease risk.



Customer Service – Increases customer engagement by allowing customers to visualize and predict their own consumption and detect atypical trends, including water leaks and fraud.



Data-driven Decision Making – Accessing and analyzing massive amounts of information enables actionable insights and intelligent decision making across utility operators, municipalities and end-users.



Remote Pump Monitoring – Electrical pumping systems represent an important part of the production cost for the water supply. By wirelessly monitoring pressure and usage data, remote monitoring systems can reduce an energy bill by up to 25 percent of the water production cost.

FRANCE'S SMART WATER METERING LEADER TO DEPLOY THREE MILLION LoRa DEVICES

Utility companies have long been at the forefront of the Internet of Things (IoT) revolution, with smart metering serving as a primary application. According to a report by analyst firm ABI Research, utilities installed 700 million smart meters in 2018, and this installed base is expected to double and reach 1.34 billion meters by 2023.

With an impressive 19 years of experience in smart water management, Birdz provides water utility operators with a wide range of services, including traditional remote index reading, billing support, leak detection, potential fraud monitoring, subscriber consumption modeling, and forecasting.

Formed out of the merger of Homerider Systems and m2ocity, Birdz boasts a heritage evolving from a proprietary radio network operator to being one of first companies to partner with Semtech and leverage LoRa devices and the LoRaWAN protocol in the deployment of smart meter projects in Europe. Birdz is a division of Nova Veolia and plays a key role in pioneering smarter solutions, such as those for the remote metering of energy consumption and waste management applications in smart cities, a new key market for Veolia's business entities.

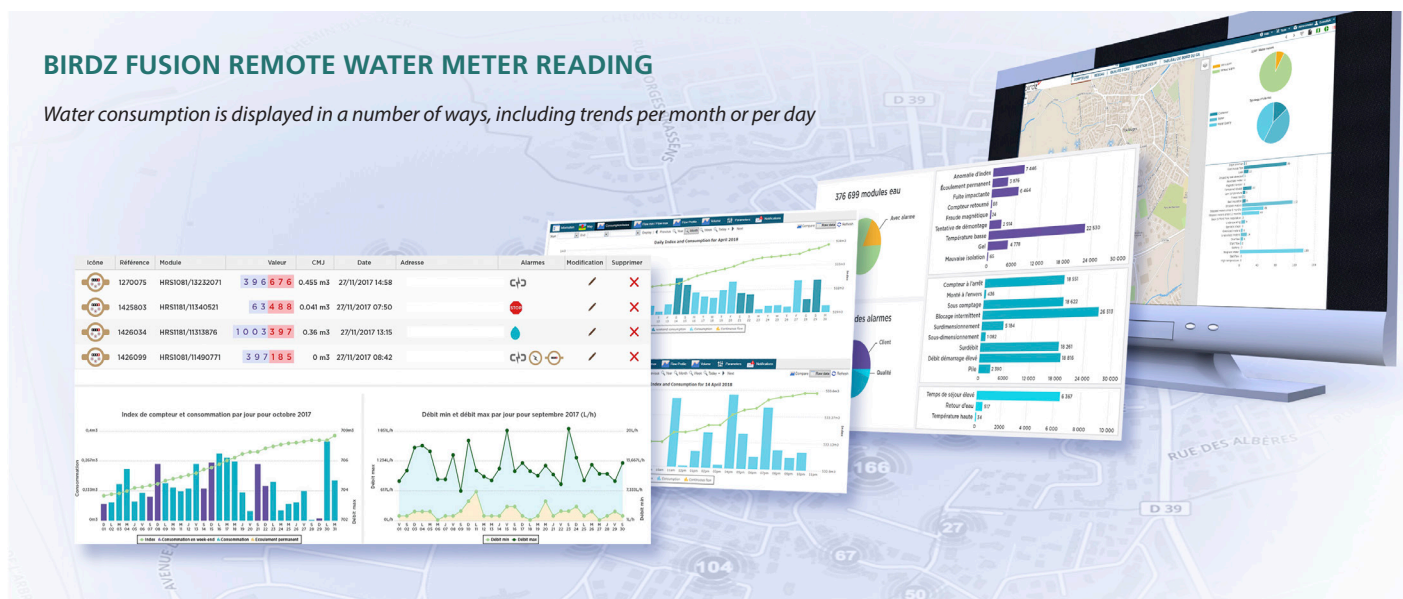
With three million LoRa-based metering devices currently operational, Birdz announced plans to expand its metering deployments by adding an additional three million LoRa-based

smart water meters throughout France. The key goal of Veolia Water, one of the world's largest water utility companies, is the remote reading of more than 70 percent of its installed water meters within the next decade.

"Semtech's LoRa devices is perfectly suited for smart water metering solutions due to its long range performance, low power consumption and low cost of implementing and operating a complete end-to-end metering application."

Xavier Mathieu, CEO, Birdz

Birdz's innovative metering systems rely on LoRaWAN networking infrastructure from Orange, the largest telecom operator in France. "It is much faster and cost-effective for us to utilize an existing LoRaWAN network from a reputable network operator, rather than creating our own," explained Xavier Mathieu, CEO of Birdz. Orange's LoRaWAN-based network covers more than 30,000 municipalities and 95 percent of the French population.



LoRa DEVICES: DE FACTO LPWAN TECHNOLOGY

In almost every industry, connectivity is enabling the development of new technologies and changing how enterprises as well as cities are embracing big data. In the case of utility companies, IoT is leveraged to collect data remotely and streamline operations. Smart metering is one of LoRa devices' most successful applications due to its unique long range, low power advantages for battery-powered meters.

LoRa is a proprietary spread spectrum modulation technique derived from existing Chirp Spread Spectrum (CSS) technology. It operates in a fixed bandwidth channel (typically 125KHz for uplink channels and 500KHz for downlink channels). LoRa modulation uses orthogonal spreading factors, allowing the network to make adaptive optimizations of individual end-node power levels and data rates to preserve battery life.

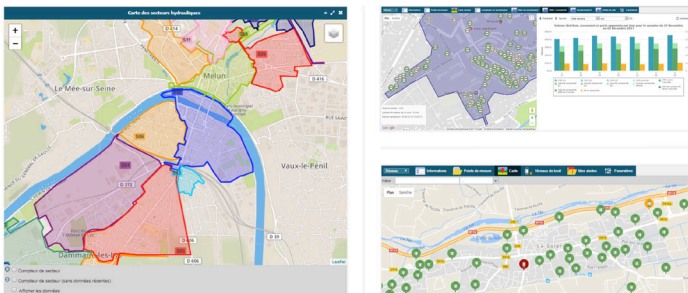
The LoRaWAN specification is a low-power, wide-area networking (LPWAN) protocol based on LoRa. LoRa-based solutions connect to the Cloud via LoRaWAN networks. LoRa devices' long range performance, coupled with its low power consumption enhances the overall performance of smart meters.

Water distribution networks are categorized as critical national infrastructure, requiring the highest level of security. The LoRaWAN specification uses 128-bit Advanced Encryption Standard (AES) algorithms to provide end-to-end encryption for both public and private deployments using two keys: one for the utilities – for the protection of payload content, and another for network operators – for network authentication security. To find more technical resources, the LoRa Developer Portal has a variety of documents as well as a catalog of solutions to help companies build their IoT applications.

"For many of our contracts, we are hired to deploy and manage a solution for up to 15 years. We need to have a long-term view and commitment for our connectivity technology. LoRa devices' global adoption and growing ecosystem are proof to our customers that this technology is the leading and lasting contender for smart metering use cases."

Xavier Mathieu, CEO, Birdz

The success of LoRa devices and the LoRaWAN protocol in LPWAN-based IoT applications speaks for itself: IoT networks based on the LoRaWAN specification are deployed in over 100 countries with an ecosystem supported by more than 500 contributing members of the LoRa Alliance®, including Birdz and Orange.



Birdz Network Management Web Interface



EAU DU GRAND LYON INCREASES NETWORK EFFICIENCY

The Métropole de Lyon is responsible for the drinking water supply and sanitation services of its more than 2.2 million inhabitants within the city and surrounding area. Eau du Grand Lyon serves as the public water service provider defining strategy, determining the price of water and managing the day-to-day delivery of safe drinking water.

In 2015, Eau du Grand Lyon implemented a smart water network consisting of 400,000 smart water G2 sensors and gateways with integrated LoRa devices. The remote water management solution from Birdz included module meters for residential and business facilities, water quality probes and noise correlator sensors on the city's piping infrastructure. The noise sensors are equivalent to a stethoscope, measuring the sound of water flowing inside pipes to easily detect and accurately pinpoint leaks.

The LoRa-enabled water sensors access the LoRaWAN network to communicate, transmit data and provide alerts. Birdz provides Eau du Grand Lyon with a "grid management" platform to correlate all incoming data and visually display key metrics on a customized dashboard. This service provides daily calculations of several key performance indicators for the water grid: volume of water supplied, volume of water consumed, apparent losses, grid output, linear loss index (LLI), and nighttime flow.

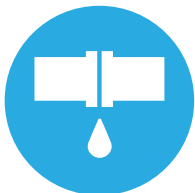
The comprehensive connected water management approach generated significant benefits:

- Identification, geolocation and faster repair of 1,200 water leaks in the distribution network
- One million cubic meters of water saved annually in production due to the improved performance of the distribution network
- An overall eight percent increase of water network efficiency in four years, from 77 percent in 2014 to 85.2 percent in 2018

Birdz plans to roll out similar systems to utility providers in the city of Toulouse, a number of Paris suburbs and other communities across Europe to help increase efficiency and productivity while driving down costs.

By understanding the long range, low power consumption and high success rates of LoRa-based solutions in real world use cases, Birdz hopes to inspire other cities to embrace smart metering and receive the transformative benefits of IoT.

BIRDZ RESULTS



1,200

water leaks identified,
located and repaired



1 million

cubic meters of water
saved annually



8%

increase in water
network efficiency





ABOUT SEMTECH

Semtech Corporation is a leading supplier of high performance analog and mixed-signal semiconductors and advanced algorithms for high-end consumer, enterprise computing, communications, and industrial equipment. Products are designed to benefit the engineering community as well as the global community. The Company is dedicated to reducing the impact it – and its products – have on the environment. Internal green programs seek to reduce waste through material and manufacturing control, use of green technology and designing for resource reduction. Publicly traded since 1967, Semtech is listed on the Nasdaq Global Select Market under the symbol SMTX. For more information on Semtech's LoRa devices and the LoRaWAN protocol, visit www.semtech.com/LoRa

ABOUT BIRDZ

Born from the merger of Homerider Systems and m2ocity and a wholly-owned subsidiary of Nova Veolia, Birdz, a pioneer in remote water meter reading, deploys its unique know-how at the service of the Smart City. A major player in IoT in France, Birdz offers a very large ecosystem of solutions to manage the city's utilities and preserve the quality of the urban environment: water, energies, temperature, pollution, noise, etc., and control the entire value chain, from sensor design to the useful valuation of millions of data collected.

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