SEMTECH CASE STUDY

Elvexys

elvexys® CONDIS GROUP

Optimizes Electrical Grids to Improve Reliability and Service Quality

As utilities face increasing pressure to modernize infrastructure and deliver more reliable service, digital transformation has become essential. This case study explores how Elvexys partnered with Swiss utility Oiken to deploy a smart, cost-effective grid monitoring solution using LoRa® technology. The result: faster fault detection, improved service continuity, and greater control over critical energy infrastructure.

QUICKFACTS

Company

Elvexys
Elvexys.com

Customer Profile

Elvexys is a Swiss technology company that delivers advanced smart grid and data communication solutions for the energy sector. With a strong focus on digitalization and interoperability, Elvexys helps utilities and infrastructure operators modernize their networks by seamlessly integrating IT and operational systems. Their expertise spans across system architecture, protocol conversion, and secure data flow management, enabling customers to gain real-time visibility and control over critical infrastructure. Through tailored solutions and a deep understanding of industry needs, Elvexys supports the shift toward more efficient, intelligent, and resilient energy systems.

Objectives

- Remotely monitor electric current in substations.
- Locate source of power outage in an electrical power grid.
- Send notification alarms when short circuits occur.

Results

- Increase visibility of energy systems and improve quality of service.
- Reduce household energy consumption.
- Battery life up to 10 years.

Products and Services

- Gateways provide up to 15km of coverage in open terrain.
- LoRa Sensors connect to the Cloud and transmit actionable data.
- Easy to deploy private LoRaWAN networks.

> LoRa allows our energy utility customers to set up their own independent network infrastructure. That is really important for them because they are used to operating critical infrastructure and they want to manage and master every single component of the system and offer the best quality of service for their customers. With LoRa this is possible.

Fabrice Strevens,
Business Development Manager, Elvexys

INTRODUCTION

Transforming utility infrastructures

One of the fundamental objectives for electric utility distribution companies around the globe is ensuring a continuous supply of electricity to its customers. An outage in the power grid can leave entire communities without electricity for hours or even days until the fault is located and corrected. The U.S. Energy Information Administration reported that in 2018, power outage durations for U.S. electricity customers averaged 5.8 hours per customer.

Since 1998, Elvexys SA has been providing clients with innovative technologically advanced solutions for the energy services industry. The Switzerland-based company has developed a wide range of expertise in a variety of technologies, such as IEC 61850, industrial Internet of Things (IoT), communication gateways, cybersecurity, and LoRaWAN® networks.

Elvexys is a member of the LoRa Alliance®, a nonprofit technology association that drives the standardization and global harmonization of the LoRaWAN standard. Elvexys deploys LoRaWAN networks utilizing its custom LoRaWAN XPG Communication Gateways. The end-to-end IoT solution can easily and quickly be installed to immediately transmit sensor data to a customer's Supervisory Control and Data Acquisition (SCADA) system.

CHALLENGE

Faster fault monitoring

There are many reasons power outages occur. The three most common causes are natural environmental factors, human error and grid overload. To improve performance and minimize interruptions in electric power, it is essential for utilities to be able to detect, locate and clear faults in its distribution lines quickly and efficiently.

Oiken, the largest electricity distributor in the Swiss canton Valais, serves 24 municipalities that are spread between Salquenen and Conthey. Oiken also manages the hydroelectric facilities, drinking water supply, public lighting, and internet services for the area. In 2017, the utility reached out to Elvexys to explore technology that would be able to measure and monitor its vast voltage network, encompassing 700 square kilometers and serving more than 90,000 people.

> Fast deployment is the key here, especially in mountainous regions, like our client Oiken. In this instance, a technician may have to drive three hours up a mountain, so spending eight hours up there each time you want to install something, it's just not feasible. For us, the easy and flexible deployment of a LoRaWAN® network is a huge advantage, and for our clients, the cost-to-benefit ratio is very appealing.
>
> **Christian Leggett,** *Project Manager, Elvexys*

Oiken's main objective was to improve the time it takes to locate the source of a power outage within its electrical grid – the intricate system that provides electricity from its generation to customers. Before, the power line networks were mainly aerial, for both low and medium voltages. Nowadays, these networks are mainly underground, giving the advantage of better reliability, but also the drawback of being more difficult to locate line failure. Previously, failures were visible and short circuits could be found by trying to isolate a specific region and then sending a technician to test every substation manually until the anomaly was discovered.

SOLUTION

The transformation and digitalization of utility infrastructures, including new fault monitoring systems that combine "smart" sensors with low power wide area network (LPWAN) connectivity, are enabling flexible and scalable systems to address traditional electrical power blackout challenges.

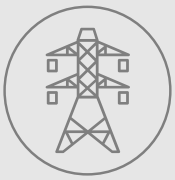
Semtech's LoRa devices and the LoRaWAN standard enable long range connectivity of IoT devices and connect sensors to the Cloud. The technology's long range performance coupled with its low power consumption enhance the overall performance of smart sensors to capture actionable data in real time.

Engineering teams from Elvexys and Oiken leveraged LoRa to co-create the LEM-301, an innovative end-to-end, wireless sensor IoT solution that can remotely monitor the voltage level and flow of electric current in substations—unlocking the ability to easily detect the exact location of faults in the grid caused by short circuits in real time. For short circuit detection and improved smart grid monitoring, Elvexys deployed two LEM-301 sensors per substation.

IN EUROPE

4 Million
existing power substations could benefit from such a solution

8 Million
sensor units need to deploy to address market



> Oiken has about 1,200 substations interconnected together. Digitalization and LoRa® technology serves as the foundation for new reliable, cost-effective and efficient substation monitoring systems.

Fabrice Strevens,
Business Development Manager, Elvexys

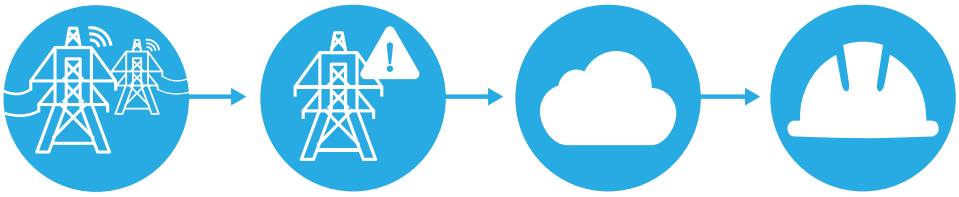
BENEFITS

Oiken estimates the amount of time to find and restore power after an electrical outage has been reduced from three or four hours to just 30 minutes.

"There are so many advantages with this LoRa® solution. The remote alarm and location functionality saves us a lot of time in detecting failures and saves money in terms of protecting our assets and those of our customers." – Alain Perruchoud, Network Convergence Director, Oiken

"It's clear that an equivalent solution based on control command would have taken about 20 years to deploy and would have cost us 10 times more." – Xavier Emery, Network Supervisor, Oiken

HOW IT WORKS:



The step-by-step process of Elvexys' LoRa-enabled solution

About Semtech
Semtech Corporation (Nasdaq: SMTC) is a high-performance semiconductor, IoT systems and cloud connectivity service provider dedicated to delivering high-quality technology solutions that enable a smarter, more connected and sustainable planet. Our global teams are committed to empowering solution architects and application developers to develop breakthrough products for the infrastructure, industrial and consumer markets.

To learn more about Semtech technology, visit us at **Semtech.com** or follow us on **LinkedIn** or **X.**