kerlink
communication is everything

Smart Metering Case Study
Real-Time Reading & Instantaneous Data Processing

December, 2017 | Version 1.0

The challenge

The global spread of digitization and the opening of electricity markets to competition have spawned new consumption-monitoring solutions and business models in the energy industry. This, in turn, has led to widespread adoption of cost-effective and standardized remote readout technologies for electricity suppliers. But there are barriers to some smart-metering systems. In Germany, for example, electricity meters are often installed in the cellars or basements of houses. This makes it increasingly challenging to read consumption data using licensed RF technologies, mainly due to the limited deep-indoor, signal-penetration strength. Two common alternatives – asking customers to record their meter reading manually, or having a technician visit the installation to record usage data – came with their own drawbacks: increased costs for utility companies, additional data-collection delay, the potential for errors, and, in the end, unsatisfied customers.

The answer

DIGIMONDO's LoRa® Meter

To overcome these challenges, DIGIMONDO GmbH, a subsidiary of regiocom GmbH, developed a solution for smart electricity meters. This smart solution reads meters in real-time and instantly processes consumer-consumption data for B2B clients using the LoRaWAN™ network supported by Kerlink's Station gateways and DIGIMONDO's LoRaWAN Network Server, **firefly**.

DIGIMONDO

Company name: Digimondo
Headquarters: Hamburg, Germany
Year founded: 2015
Industry sector: Smart metering end to end solutions

DIGIMONDO's three-phase electricity meter is used for direct, one- or two-way measurement of active energy consumption in a 4-wire or 3-wire network. It can be equipped with additional functions to meet customer requirements. The meter can support LoRa™ communication class A and C, based on LoRaWAN Meter Protocol Version 1.2e, to transmit meter data. It also transmits digital energy consumption data with a high level of security. The communication interface supports wireless communication according to the LoRa standards in the frequency band 868MHz. Classes A and C are implemented according to the LoRaWAN protocol.

DIGIMONDO LoRa® smart electricity meter

Smart Metering Case Study
Real-Time Reading & Instantaneous Data Processing

December, 2017 | Version 1.0

DIGIMONDO's firefly platform

DIGIMONDO has installed more than 1,100 smart-electricity meters in the German city of Gehrden and surrounding areas, supported by 17 Kerlink Station LoRaWAN gateways. These installations began as a limited network test in 2015, and scaled up to be the largest LoRaWAN network in Germany by 2016. The smart-meter data is displayed and managed in real-time in **firefly**, the fastest, most stable and highly secure premium LoRaWAN network server from DIGIMONDO, enabling continuous monitoring of all the meters. DIGIMONDO launched an upgrade for firefly v1.1 with advanced features, including the Transport Layer Security (TLS) protocol to protect data and the MQTT IoT and M2M protocols. The LoRaWAN 1.1 standard will be implemented in upcoming releases.

DIGIMONDO has also developed a B2B customer app called MeterApp for the owner of the meters, "e.kundenservice Netz", the billing company of the utility e.on. The app provides real-time meter data at every 15-minute interval. In case of network unavailability, the app fills the gap by normalizing the values and shifting them on quarterly basis to add to the full-day data. e.on additionally has a B2C end-user app for its residential customers.

Kerlink Wirnet™ Station

LoRaWAN Gateway

Introduced in 2014, Kerlink's carrier-grade **Wirnet iBTS Compact Gateway** was the first LoRaWAN gateway on the market. Incorporating LoRa bidirectional communications technology, this long-range and low-power gateway is available for different geographies (868 / 915 / 923 MHz) and offers 49 LoRa demodulators over nine channels. It also offers exclusive features like specific saw filters to limit interference with LTE, real-time radio scanning, ERP up to 27 dBm, ethernet or 2G/3G backhaul and integrated GNSS high-sensitivity GPS modules. It also includes native, ruggedized IP67 casing and system monitoring-and-alarming capability (memory and CPU usage, hardware failure). This gateway is fully compatible with equipment from all third-party, core-network providers, enabling flexible and scalable deployments across many industries – energy, agriculture & environment, transportation & logistics, buildings & facilities.

LoRaWAN IoT network deployment by DIGIMONDO in Berlin, using Kerlink Wirnet™ Station LoRaWAN gateway.

The benefits

The LoRaWAN network generates efficiency of higher than **97 percent of uninterrupted connectivity**, compared to approximately 80 percent efficiency of meters in basements with classic mobile-radio connectivity like LTE.

DIGIMONDO's LoRaWAN network server firefly, offered both as software-as-a-service (SAAS) and on-premise, connects objects to the company's public and site-specific, customer-owned private networks. firefly-based networks have delivered **99.99 percent uptime**.

The combination of DIGIMONDO's LoRaWAN core network and Kerlink's LoRaWAN gateways ensured a scalable, robust, efficient and reliable network for electrical metering, as described in Semtech's white paper, "Real World LoRaWANTM Network Capacity for Electrical Metering", published in September 2017. An average gateway of the network, i.e., a gateway where throughput is the average of all the gateways of the network, can handle:

 • **470.000 messages per day** from the EMeters without repetition

• **Up to 1 million messages per day**, if the EMeter packets are repeated twice, and in case of frequency diversity, the gateways can even process up to **2 million uplinks per day.**

This concrete field deployment also confirmed the capability of scaling up locally by simply inserting a Kerlink gateway. The ADR (Adaptative Data Rate) can further increase the capacity by optimizing the data rate, the repetition rate of each frame and the set of channels used by the device.

More success stories at https://www.kerlink.com/customers-usecases/use-cases/