Siretta's SNYPER-LTE Graphyte is instrumental in ensuring connection reliability for Stadtwerke's smart meter rollout thanks to support from Industrial IoT supplier, Dacom West.

As a result around 9000 intelligent measuring systems will run on the best network.

Stadtwerke Borken/Westf. / Stadtwerke Coesfeld, Germany chose in depth cellular network analysis for smooth installation of intelligent measuring systems.

Once a year, an employee of the energy supplier reads the current status of the electricity meter in every household. With the installation of an intelligent measuring system (Smart Meter), this visit is no longer necessary, as the collected data is automatically transmitted digitally. Due to legal changes in Germany, the installation of a smart meter is mandatory for annual electricity consumption of more than 6,000 kWh. In order to make the rollout of the devices by the energy supplier as effective as possible and to avoid additional costs in the long term, an optimal installation of the technology on site is necessary. For this reason, the Borken and Coesfeld municipal utilities decided to use a cellular network analyser to support the employment.

Author: Samira Liebscher, freelance journalist

Stadtwerke Borken and Coesfeld are active in the supply of energy and drinking water and also provide the citizens of their town with baths, parking space and fibre optic cables. They are part of the EMERGY group of companies, which supplements the Stadtwerke's service portfolio with innovative services and the operation of infrastructures.

Intelligent metering systems regularly determine the consumption data and send them automatically via the network to the electricity supplier and network operator. On-site reading of the consumption values is therefore no longer necessary. In the long term, the installation of smart meters will also eliminate the time-consuming and cost-intensive manual reading process for the Borken and Coesfeld public utilities.

But what saves resources in the long term is initially a challenge: all electricity meters in households with an electricity consumption of over 6,000 kWh must be replaced successively. However, the meter cannot simply be replaced one-to-one.

Change from conventional to intelligent metering systems

In accordance with the requirements of the so called „Messstellenbetriebsgesetz“ (Metering Point Operation Act), the metering point operator must ensure reliable and safe technical operation of the

smart meter at all times. Continuous data transmission through reliable network communication plays an important role in this respect. An unstable communication link and interruptions in data transmission would therefore inevitably lead to multiple trips to the point of consumption

despite generally automated transmission.

"After the increased expenditure due to the legal changes for the installation of smart meters, we saw the introduction of an extended tool support for the plannable and effective installation of the intelligent metering systems as absolutely necessary", says Michael Selting, Head of the Metering/Installation Department of Stadtwerke Borken/Stadtwerke Coesfeld. The aim was therefore to find a solution that would enable an effective rollout of smart meters and an analysis of communication breakdowns.

Network analyser as a suitable solution

During an extensive online research, the responsible persons of the municipal utilities came across different devices for mobile phone analysis and shortlisted four tools. All solutions were examined more closely and compared to the specific requirements. For example, the network analyser had to be able to connect an antenna to a Fakra connection. Other requirements of the Borken and Coesfeld public utilities included functions for long-term and live measurements, coverage of as many available providers and frequency bands as possible, simple, intuitive operation and a compact design.

Due to the corona situation, the functions of the SNYPER-LTE Graphyte from Siretta Ltd. were presented in detail to Mr. Selting and his team via online conference by the distributor DACOM West. In addition to the device itself, a suitable solution had to be found to connect it to the smart meter gateway antennas with Fakra connection. An SMA/Fakra adapter was tested for this purpose, which was suitable for the combination due to its very low contact resistance. In order to be able to get a comprehensive picture of the product in advance, the municipal utilities were supplied with a test device by the distributor. It became clear once again that the tool does not require any additional technical requirements, but can be operated completely stand-alone.

Due to the live scan function, the possibility of a long-term measurement as well as the results of a detailed cost-benefit analysis, the SNYPER-LTE Graphyte was finally chosen. The installation and configuration of the device was carried out on site by DACOM West in cooperation with Mr. Selting and the head of the department Networks Construction/Operation Electricity of Stadtwerke Borken/Stadtwerke Coesfeld.

"With this signal analyser, we have the chance to optimally align the network antennas of the smart meter gateways or - especially as in our rural areas - to find a cellular network signal of sufficient strength at all in order to operate the measuring systems safely and stably with a minimum of operative effort", says Michael Selting. In addition, there is the installation of "conventional" technology in the field of recording power measurement (RLM) for new installations or for error analysis of critical communication links. "The use of the SNYPER-LTE Graphyte eliminates duplicate customer visits due to connection problems. As a rough estimate, the device has already redeemed itself in 15 to 20 saved visits.

Long-term measurement against network problems

Up to now, those responsible at municipal utilities have occasionally encountered problems with the connectivity of RLM meters. During these measurements, the meter records average performance values at 15-minute intervals and transmits these once a day (usually at night) to the municipal utilities. Although the communication modules were booked into the supposedly "strongest" network, they occasionally showed communication difficulties. By means of the long-term measurement of the SNYPER-LTE Graphyte signal analyser, those responsible at the Borken and Coesfeld municipal utilities have the possibility of activating an overnight measurement on site to evaluate the behaviour of the various communication bands of the available providers. "By carrying out this analysis, we can shift the communication units to another frequency band or to another provider, which may not be the strongest, but is the most consistent frequency band or the most constant provider at the corresponding point of consumption," says Michael Selting.

The further evaluation procedures of the SNYPER-LTE Graphyte also simplify the analysis and management of smart meters in everyday life. For example, the measurement results can be analysed on the computer as a clearly prepared web page and raw data file (CSV).

There is also the option of uploading the results to a cloud application, in which additional evaluation options (e.g. localisation of base stations) are available.

Conclusion

Due to legal requirements for conversion to intelligent measuring systems, the Borken and Coesfeld public utilities decided to use a cellular network analyser to simplify the installation of the devices and to plan maintenance more efficiently. "The combined solution consisting of the SNYPER-LTE Graphyte from Siretta Ltd. and a Fakra connection exactly meets our requirements and we were able to integrate it easily into our workflow," says Michael Selting. "We now use the SNYPER-LTE Graphyte on a regular basis, and so it is used in the installation of around 9,000 intelligent measuring systems. We can handle the rollout more smoothly, analyse communication gaps, react accordingly to the results and optimise the personnel effort for a functioning measurement system".