5G GATEWAY FOR NETWORK SLICING IN SMART GRID INFRASTRUCTURE

HIGHLIGHTS

- Korero GmbH, a German consulting firm, helps companies in the smart city, energy, and mobility industries achieve greater operational efficiency and security in their IoT solutions.
- To establish a highly secure and reliable network infrastructure for utility companies specialising in smart grid infrastructure, Korero chose the Teltonika TRB500 5G gateway to address security and remote management concerns.
- The TRB500 cellular gateway provides high-speed and low latency connectivity. And with support of multiple M2M communication protocols and SA and NSA 5G network architectures for network slicing, it becomes an indispensable IoT device, ensuring reliable and smooth data transmission.

THE CHALLENGE – DATA SECURITY & CONNECTIVITY CONCERNS

It might be hard to believe, but 90 % of global companies specialising in the energy and utility sectors have been exposed to third-party data breaches in 2023 alone. In this context, ensuring the highest security standards of company data is no longer added-value, but rather an indispensable requirement.

But knowing this is not enough.

Energy and utility companies face a major cybersecurity challenge related to securely integrating data travelling from diverse sources into a central IoT platform, like SCADA. Another way of explaining this would be to say that data must be safeguarded from the Internet and the prying eyes of the cyber realm.

This is why the connectivity components used to implement communication between substations and remote control centres must be extremely reliable and feature numerous security measures to protect data against intrusions and ensure its integrity. However, when selecting the right networking equipment, cybersecurity must be balanced with a host of other priorities.

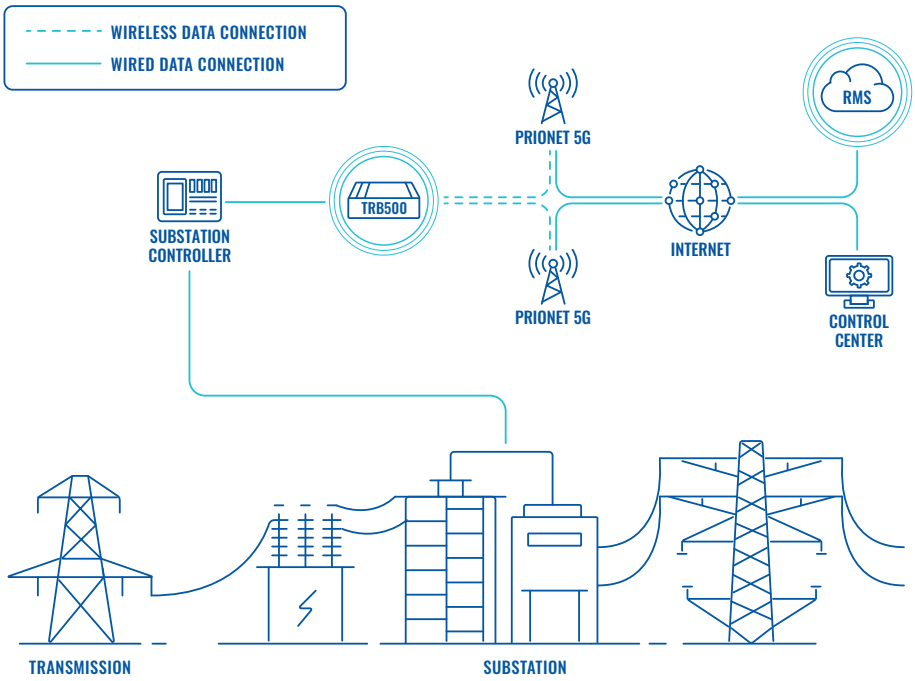
Beyond the paramount concerns of security, the energy and utility sectors must also consider establishing redundant network paths. Unfortunately, this isn't easy to achieve, considering the remote areas where substations are generally established...

cough, in the middle of nowhere, cough.

Making matters worse, the remote locations of substations also make it challenging to ensure that all endpoints are accessible at all times. This accessibility is crucial not only for reaching the devices but also for enabling prompt maintenance and troubleshooting without depending on on-site communication processes.

And last, but certainly not least, since data streams from multiple endpoints, it can arrive in different formats, including binary or XML data encodings. Such format variation necessitates the device to support multiple industrial communication protocols that would enable smooth and secure data encryption and reading mechanisms.

TOPOLOGY



THE SOLUTION – 5G GATEWAY COMBATTING THEM ALL

Meeting the complex needs of utility companies is a formidable task, so Korero GmbH has placed its confidence in the Teltonika TRB500 5G gateway when implementing its solutions for German utility companies, specialising in smart grid infrastructure. The IoT gateway is capable of addressing the full spectrum of requirements and eliminating any security concerns in an instant.

Plugged into a substation's controller via its RJ45 port, the TRB500 5G gateway fits smart grid solutions like a glove thanks to its advanced connectivity performance capabilities and compatibility with our Remote Management System (RMS) for remote management purposes.

But first things first – let's talk about that noteworthy secure connectivity.

The TRB500 IoT gateway can reach speeds of up to 1 Gbps, ensuring high-speed data rates and ultra-low latency, and supports both SA and NSA network architectures, which is crucial for the next step. With the implementation of 5G SA (Standalone) technology provided by Prionet, Korero establishes network slicing.

Now, network slicing is a shiny and very exciting feature that comes with 5G networks: it enables a single physical device to be virtually split into multiple virtual networks. Each network can be assigned to take care of individual tasks, which, in this case, regard redundant connectivity, isolated segments for each critical infrastructure component, and implementation of security protocols.

Thanks to the network slicing the 5G gateway supports, each smart grid infrastructure is equipped with robust network connectivity supply and secure, streamlined data flow to the central IoT platform. But that's not all.

The TRB500's great advantage is the supports of a myriad industrial communication protocols, including OPC UA, Modbus TCP, DNP3, and so on. All these protocols are vital for securely gathering all the transmitted data within the smart grid infrastructure.

Aside from great speeds, low latency, support for 5G SA technology, and industrial communication protocol support, this 5G cellular gateway is also compatible with RMS, making Korero's remote management and maintenance dreams come true.

RMS allows Korero to access and monitor the TRB500 5G gateway remotely. It also facilitates secure connections to the cellular gateway and substation's controllers. The simple integration of RMS enhances this solution by enabling convenient access to remote solutions globally, at any time.

Teltonika's networking devices aren't just for solving network connectivity issues – they establish a more secure and well-managed network infrastructure. So, with our TRB500 5G gateway, the smart grid infrastructure of Germany's utility sectors is ensured reliable connectivity and robust security.

And that's not a promise, but a guarantee.