



THALES
Building a future we can all trust

Enabling Secure and Scalable Smart Grid Connectivity through Teltonika and Thales Collaboration



A new smart grid era in North America, connected and secured

All around the globe, Distribution System Operators (DSOs) expand the deployment of connected devices within smart grids; not only smart meters for consumers but also a wide array of sensors to optimize operational efficiency. That's particularly the case in North America, the region being active and leader in the deployment of second generation of smart meters.

The Next-Gen advanced metering AMI2.0 offers real-time data and more control over energy usage, empowering consumers as well as helping Utilities to build a resilient grid with a reduced carbon footprint. The demand for reliable, timely, and secure data collection has never been greater. These devices are often spread across diverse and sometimes hard-to-reach locations, requiring robust connectivity hubs and resilient communications networks.

Given the critical nature of the smart grid infrastructure, cybersecurity concerns are paramount. Connected devices and their data represent potential vulnerabilities that cyber attackers could exploit. Ensuring the integrity, confidentiality, and availability of these assets is thus at the heart of operational security strategies.

A growing trend in North America is the deployment of private cellular networks within cities or local areas dedicated to critical infrastructure. Many DSOs are making significant investments to build their own private core networks, aiming to secure devices, safeguard data, and maintain a trusted environment independent of public networks. However, the rollout of these private networks can take considerable time, while operational optimization needs are immediate, and public network is available right now.



LTE Low Power Wide Area Network transition to 5G Redcap for massive IoT deployments

In the evolving landscape of smart grid deployments, 5G Redcap (Reduced Capability) technology offers a compelling advantage by delivering an ideal balance between performance and cost. Unlike full-fledged 5G, which often exceed the bandwidth and complexity requirements for many grid devices, Redcap is specifically designed to provide sufficient throughput and low latency at a fraction of the cost and power consumption. This makes it especially suitable for massive IoT applications such as metering, grid telemetry, and distributed sensors, where large numbers of devices need reliable connectivity without overburdening budgets. By leveraging Redcap, utilities can scale their IoT networks efficiently, ensuring coverage and data integrity without unnecessary expense.

Although 5G is gaining momentum, the full deployment of its standalone technology is far to be ready for massive IoT deployments. Both low power IoT connectivity LTE-M and NB-IoT are the key technologies for any immediate projects, built to last for the next decades with a future coexistence together with the 5G and its different variants, like Redcap. LTE-M and NB-IoT are catalyst for future large 5G deployment.

The large investments of private DSOs in North America into private LTE network for their own operations is the perfect illustration of the above. 5G is already in the roadmap as a key milestone and transition to new infrastructures to ensure universal energy access, providing secure, clean, resilient, and reliable energy to all populations.



Teltonika and Thales partnership: accelerating secure smart grid connectivity

To bridge the gap between the immediate need for optimized smart grid operations and the longer-term deployment of private 5G infrastructure, Teltonika and Thales offer a collaborative solution leveraging their respective strengths.

At the heart of enabling seamless connectivity in such smart grid ecosystems is the Teltonika RUT976 5G Redcap router. This rugged, industrial-grade device delivers reliable internet access directly at the edge where devices and sensors operate, such as concentrators connected to smart meters through a private RF mesh network, that could be located to a substation with no fiber.

Equipped with native Thales eSIM SGP.22 support and remote provisioning capabilities, the RUT976 allows distribution system operators to activate and manage multiple network profiles over-the-air, avoiding costly and time-consuming physical SIM swaps.

CASE STUDY

Seamless swap from public to private network

Initially, the router can connect to public LTE or 5G networks, ensuring immediate operational capability. As soon as private LTE or 5G cores become available, DSOs can remotely switch the connectivity profile to these dedicated, secure networks without any service interruption. The Teltonika router is always connected to a cellular network, thanks to the eSIM flexibility and its remote profile provisioning capability, avoiding any costly manual intervention.

Additionally, the built-in multiple eSIM fall-back functionality provides continuous internet access, maximizing uptime and resilience in critical infrastructure.

CASE STUDY

Mutual assistance among DSOs

The U.S. electricity distribution system refers to a mutual assistance framework among DSOs. When one local DSO experiences difficulties in distributing energy, due to outages, capacity shortage or emergencies, other DSOs provide support to help restore or maintain energy supply to consumers. That includes the temporarily switch of connected devices to another connectivity provider for their remote control.

The Teltonika RUT976 5G Redcap router's inherent capability to connect to a cellular network through the eSIM IoT remote Manager platform (Thales eIM platform), ensures that the temporary switch can be handled smoothly with limited impact for consumers. This multi aid concept promotes resilience and reliability in power distribution by fostering cooperation among DSOs and optimizing resource utilization within the U.S.



Key takeaway

Thales secures the identity and lifecycle management of connected devices through its advanced eSIM technology and related services, while Teltonika delivers rugged, protocol-ready routers designed for remote management and reliable field performance. The RUT976 5G Redcap router and Thales eSIM SGP.22 solution jointly provide an integrated system that enables rapid deployment over public cellular networks or smooth migration to private 5G, and scalable, secure connectivity for massive IoT in utility environments. Looking ahead, both companies have a roadmap plan to develop a future common product leveraging the new eSIM SGP.32 standard to further enhance integration and deployment of connected devices in the smart grid.

Together, Teltonika and Thales empower energy utilities with fast-start connectivity, seamless network transition, and dependable scalability, accelerating the smart grid evolution with security and operational efficiency as foundations.



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Thales IoT Solutions

ADVANCING SECURE, SCALABLE, AND SEAMLESS IOT DEPLOYMENTS

Industry-Leading Standardization & Certification

Thales leads the way in IoT standardization, actively shaping future requirements alongside the GSMA and other key organizations. Thales holds a majority share of GSMA eSA certifications globally, over 53% as of July 2025, ensuring unmatched regulatory compliance and reinforcing customer trust. Thales also meets the highest cyber-security standards, including GSMA IoT SAFE, safeguarding devices across their entire lifecycle.

Trusted Partner and Ecosystem Leader

Having successfully delivered more than 400 projects, we are the industry leader in Remote SIM Provisioning platforms for both consumer and IoT environments.

Fundamental to our approach is fostering collaboration throughout the entire IoT ecosystem: we actively partner with chipset makers, module developers, OEMs, service providers, connectivity providers, and standards organizations to build a secure, fully integrated, and future-proof IoT environment.

For more information, visit our website.

Teltonika

THE INDUSTRIAL HARDWARE FOUNDATION FOR 5G SMART GRID EVOLUTION

Teltonika delivers the rugged, industrial-grade reliability required at the very edge of the smart grid. The **RUT976 5G Redcap router** is designed specifically to meet the high demands of utilities, providing a secure and resilient connectivity hub for metering, grid telemetry, and distributed sensors in diverse and challenging environments.

Key Advantages of the Teltonika RUT976 for Utilities:

- **Industrial Ruggedness:** The device is engineered to operate reliably in a wide range of temperatures and harsh physical locations, ensuring consistent uptime in the field and at the substation.
- **Redcap Advantage:** By leveraging the power and efficiency of 5G Redcap, the RUT976 offers the ideal balance of sufficient throughput, low latency, and reduced power consumption, making massive IoT deployments both affordable and scalable.
- **Connectivity Resilience:** The router features a built-in multiple eSIM fallback functionality, guaranteeing continuous cellular connectivity to maximize uptime and resilience for critical infrastructure.
- **eSIM SGP.22 Integration:** The RUT976, equipped with Thales eSIM SGP.22 standard, acts as the secure execution environment that enables over-the-air profile management. This allows Distribution System Operators (DSOs) to remotely switch network connectivity profiles – from public to private networks and during mutual assistance scenarios – without costly physical SIM swaps.

Through this specialized, reliable hardware, Teltonika accelerates the smart grid's evolution, empowering energy utilities with fast deployment, seamless network transition, and dependable scalability.



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