

CONNECTIVITY FOR CIRCULAR BATTERY ENERGY STORAGE SYSTEMS

HIGHLIGHTS



- ✔ [Watt4Ever](#) is a Belgian provider of affordable, sustainable, and local battery energy storage systems driven by a circular economy.
- ✔ To maintain the optimal safety and security of these systems, a network connectivity device must be included in the solution.
- ✔ Accomplishing this goal is the combination of our RUT241 cellular router and TSW110 Ethernet switch – guaranteeing seamless, uninterrupted data flow between solution and control center

THE CHALLENGE – BATTERIES & THERMODYNAMICS

According to the first law of thermodynamics, the energy of a closed system must remain constant. It doesn't increase or decrease. In other words, energy doesn't go anywhere.

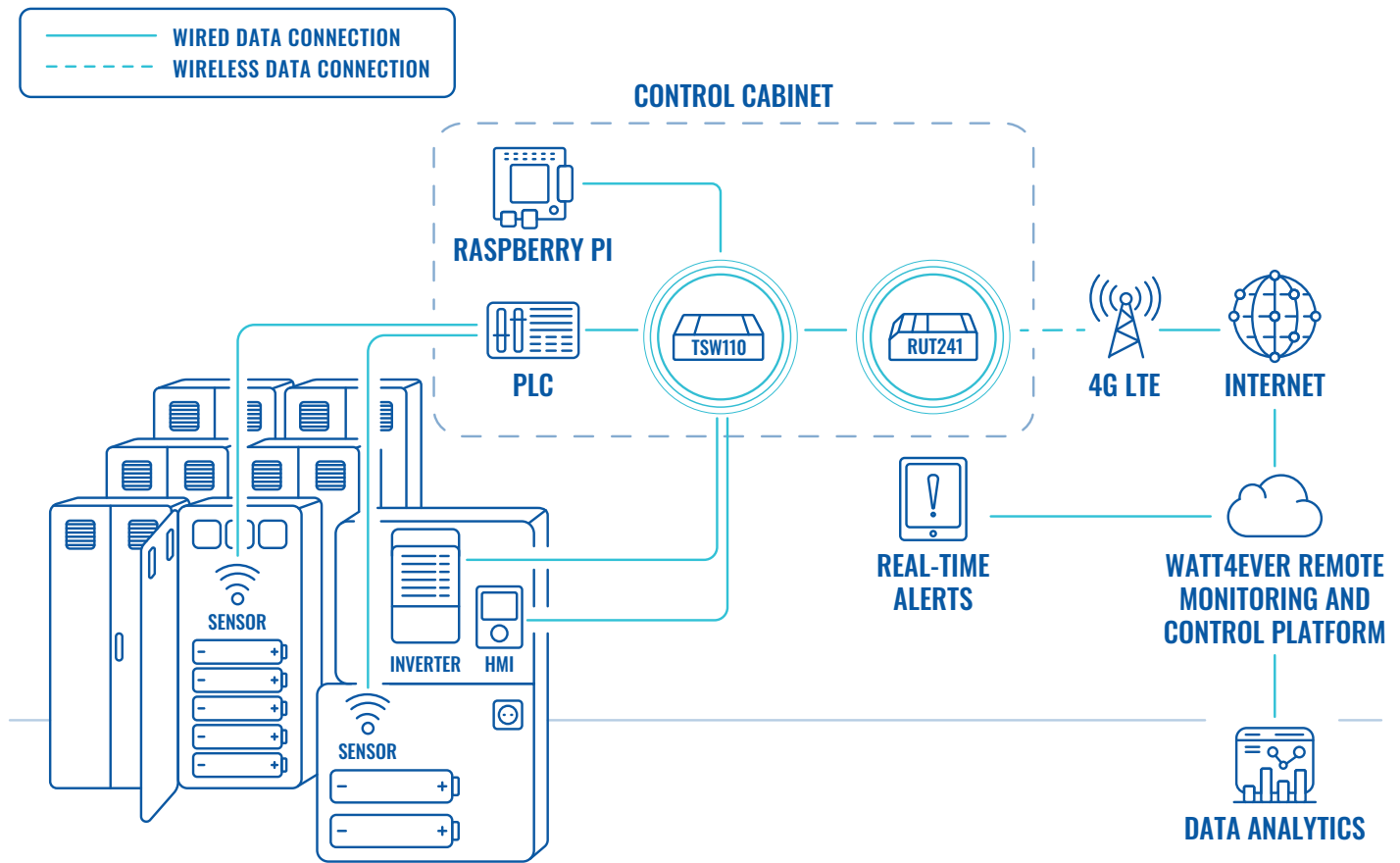
The same cannot be said for the battery energy storage market, which *does* increase in value and growth. [This market is expected to grow](#) from \$10.88 billion in 2022 to \$31.20 billion by 2029 at a CAGR of 16.3%.

But just because the market doesn't obey thermodynamic principles, it doesn't mean your market activities can't! One of our Belgian partners, Watt4Ever, dismantles electric vehicle battery packs at their end-of-life stage and gives them a new purpose by developing battery energy storage systems. These upcycled systems come in both low and high-voltage varieties and can scale the number of batteries for any given application required. These can range from small and medium-sized enterprises to warehouses and retail buildings, and more.

Watt4Ever's energy storage systems ensure that batteries, too, remain constant in the market's closed system. However, in order to maintain the optimal safety and security of such a solution, it must be able to read variables like temperatures, voltages, inverter phases, and component statuses in real time. If it can do so remotely and send the aggregated data to a cloud server for analysis – even better.

How can that be accomplished? With a Teltonika Networks network connectivity device, of course!

TOPOLOGY



THE SOLUTION – A RELIABLY-CONSTANT SYSTEM

Watt4Ever chose the RUT241 industrial cellular router by Teltonika Networks to establish LTE Cat 4 connectivity for its battery energy storage systems. The router is connected to our TSW110 Ethernet switch via a WAN port and the switch is connected via Ethernet to a number of components. These include a Danfoss inverter for control of the storage system, an HMI for on-site control, a PLC, and a Raspberry Pi.

These components, along with additional sensors, inverters, and innovative alarm systems, together function as the brain of the battery pack and receive data through the Battery Management System slaves installed on each module in the pack. The data is read by this “brain” using the ModBus industrial protocol. With the connectivity provided by RUT241, that data is then sent to Watt4Ever’s remote monitoring and control platform for further analysis and real-time alerts.

For maximum safety and security, the battery energy storage system has three independent communication systems: 4G, LAN, and Wi-Fi. Enabled by the RUT241 router, this ensures a constant and uninterrupted data flow from solution to control center. Bolstering this connectivity safety net is the router’s WAN failover feature, which automatically switches to another available backup connection in case the original connection is interrupted for any reason.

For the energy of a closed system to remain constant, that system must be as reliable as possible. This is what Watt4Ever offers with its battery energy storage systems, and is exactly why it chose Teltonika Networks for this solution.

