



UNINTERRUPTED INTERNET CONNECTIVITY IN DESERT RACE

SUMMARY

Just as Rome wasn't built in a day, no great technological advancement was made without research and development. A group of German students has created a solar-powered car to enter into races all over the world, where they prove their concept and gather data to further improve their technology. Connectivity becomes a big part of the race and has significant influence on the end result.

CHALLENGE

Team Sonnenwagen entered their latest electric, solar-powered car, Covestro Photon, into the Solar Challenge Morocco 2021 race. Although, the race car was not the only one on the road as a supporting convoy always followed suit. One of the supporting cars is dedicated to the driving strategy team. Their role in the race is to relay important information to the solar car driver to proceed without any problems.

The racecourse stretches throughout mountains, deserts and unpopulated areas. This race layout makes having a good internet connection quite challenging. Without it, the team cannot access weather and location data and other important information. The team needed to ensure somehow that the convoy had uninterrupted access to the internet. And to top it all off, the car was constantly moving.

PARTNER - TEAM SONNENWAGEN AACHEN

Sonnenwagen is a team founded by German students of RWTH Aachen University and FH Aachen. Their goal is to help build a more sustainable future where solar energy and mobility go hand in hand. To achieve their target, Sonnenwagen bi-annually participates in Solar Challenges worldwide. Since 2015 they have developed three solar race cars. Each model is more advanced than the last one and has fewer faults in entering the most demanding solar car races.

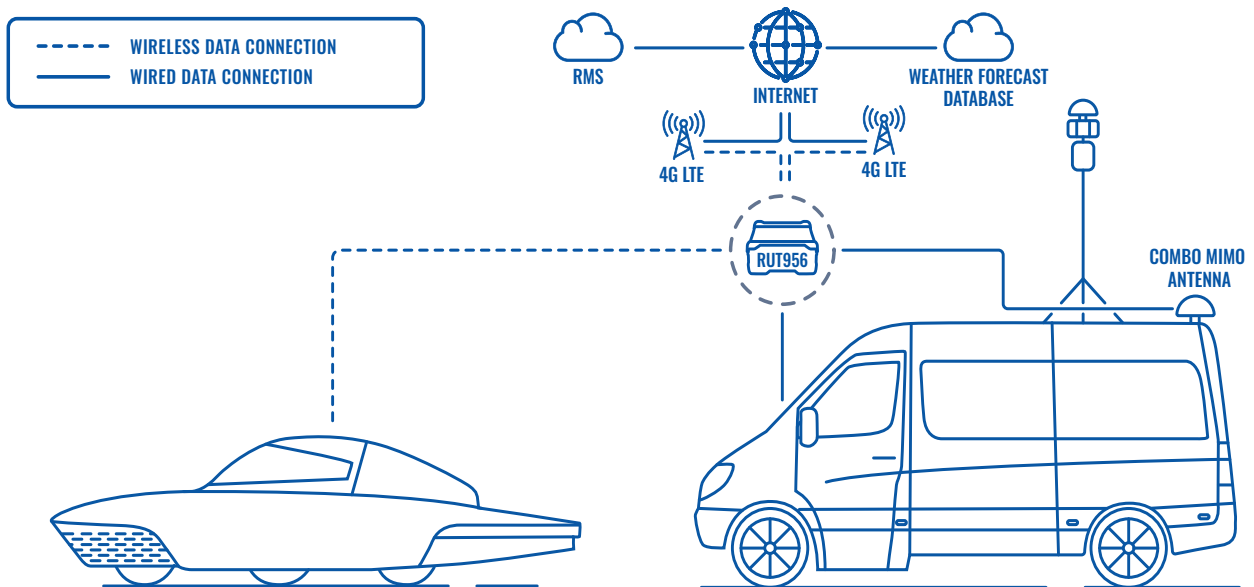
SOLUTION

The Sonnenwagen team used Teltonika Networks RUT956 industrial cellular router with the COMBO MIMO Mobile/GNSS/Wi-Fi Roof SMA antenna. This IoT solution ensured that the support team had an uninterrupted internet connection, which they used to acquire accurate weather data. Then the information was relayed to the solar car driver, and the route adjusted accordingly, as solar panels can't charge without sunlight.

The dual SIM with a failover allowed RUT956 to provide constant and stable internet access even in remote areas. A GNSS receiver was also connected to the router and a Sonnenwagen server. These features enabled continuous geographical tracking of the team and processing all the received data. The Sonnenwagen team first tested the router extensively and only after passing with flying colors was it installed in the Strategy Car.

Moreover, RUT956 runs on RutOS, an open-source operating system that lets anyone to adapt it with their specific requirements. The team could easily integrate their API and have complete access to the router system. Thanks to this compatibility, they could constantly monitor temperature, connection status and retrieve warnings if something didn't look right.

TOPOLOGY



BENEFITS

- RutOS allows integrating a custom API that can gather critical diagnostic data.
- RUT956 provides reliable cellular connectivity thanks to dual SIM and failover functionality.
- RUT956 router can easily integrate with other products like antennas to further increase the strength of the internet connection signal.
- The router can easily withstand high temperatures, vital for working in desert conditions.
- RUT956 has an E-mark certificate, that allows it to be used in vehicles.

WHY TELTONIKA NETWORKS?

According to Sonnenwagen, "Having a solution that allowed the team to establish a server inside the Strategy Car and have a stable internet connection at any time, any condition and anywhere, especially in the desert, was crucial for the race. For this reason, Sonnenwagen chose Teltonika Networks as it is well-known for its stable and reliable networking connections."

