Starkstrom Augsburg

Success Story – IoT in a Race Car

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The fully electrically powered 4WD race car from „Starkstrom Augsburg e.V.“provides it's live telemetry data online. Therefore, the LTE network is used and not the at the events of formula student often overloaded 2,4 GHz WiFi.

The Project

Starkstrom Augsburg e.V. is a nonprofit association which educates soon-to-be engineers about electric mobility. Since founding in 2011 the fascination is going on. Every season up to 100 students from all faculties of the University of Applied Science Augsburg work together on this project.

After six electric racecars from which one was adapted to drive autonomously the team is now facing new challenges. In 2018 the main goals are to improve the existing technology, increase maintainability and to enhance the performance of the racecar. To distribute the live telemetry data the team used only WiFi. This locally limited system shall now be upgraded, such that the car can now register itself in the LTE-Network and allow access to the logging and telemetry device over OpenVPN. Therefore, a router from NetModule is going to be used. The NB800-Series device shall be integrated in the car.

Requirements

- Power supply directly by the Low-voltage System of the car with 12-16,8V
- Ability to use OpenVPN
- Tolerant against EMI from the near inverter
- Low Weight

The Solution

Together with NetModule the NB800 LTE&WiFi together with a Coach-2L2WG antenna was chosen. This device offers the required functionality while maintaining a light weight.

The low height of the antenna enables the team to place it almost anywhere on the racecar. To reduce the aerodynamic effects different options are evaluated by the team. Underneath the front cover and in the rear wing of the car are the preferred options. As the racecar is built almost entirely from carbon fibers the altered characteristics of the antenna have to be determined.

To improve the product further Starkstrom also is in contact with NetModule. For the autonomous car, which is now in further development a source of real time correction data for the GNSS is required. This interface is going to be used to request correction data from the wireless network and pass it to a connected device.

Why NetModule

"The router from NetModule enables us to receive telemetry data without the need of being near the race car."

Stephan Ruber
Head of Electric