

Case study

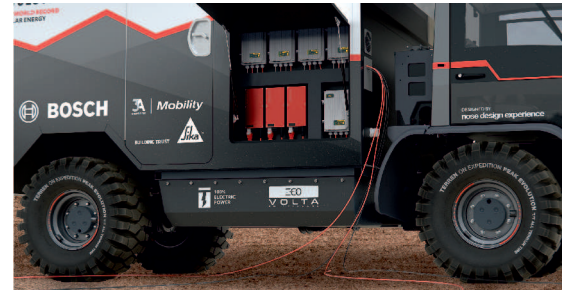
High Altitude World Record Expedition

Switzerland/Chile



The challenge

The Swiss Startup Company DDP Innovation develops an electric Off-road transport Vehicle. To promote the new product and prove the technology. The three company founders plan to set a new altitude world record for land vehicles at the 6893m high Ojos



DDP Innovation

del Salado in Chile. The Mountain lies 300 kilometers away from the next power supply and the DDP Innovation set the goal to complete the record 100% carbon neutral. So a way to charge the high voltage Traction battery with solar energy had to be found.

Why STUDER

Apart from the basic functionality of charging the battery, the system had to fulfill special requirements. It has to provide redundancy in case of component failure and it has to work at altitudes up to nearly 7000m. The Studer devices have proven to work under the most extreme conditions which made the first choice for this project. Studer also provided close technical support to calculate the performance of the devices under the special conditions.

System components

The system contains the following components:

- Solar modules: 20 x Megasol M370-HC120 7.4kWp
- MPPT/Chargers: 5 x Studer VT65
- Inverter: 1 x Studer AJ2400
- DC-DC converter: 2 x Brusa BSC624
- Battery: EcoVolta Evo Traction Battery 300V 90kWh

The Solution

The solution was to divide the solar modules into 5 strings of 4 panels, one string is mounted on the vehicle roof and provides power constantly while 4 strings are laid out on the ground during the midday hours to charge the battery. The system will spend around two weeks at an altitude of more than 5000m. The main challenges for the devices in the thin air is reduced dielectric strength of the air and decreased cooling capability. For this reason the maximum PV voltage was reduced to 65V to avoid electrical breakdown inside the devices and the peak power is set to 1480Wp per VT65. The 5 strings of panels are connected 2s2p and each feed one VT65. The power is then converted from 24V to 300V by 2 Brusa BSC624 DC-DC converters.

Project outcome

The project is still in progress. The vehicle is being built till the end of 2021 and the world record attempt will happen in 2022 or 2023. The mobile solar plant with the Studer devices will become operational by the end of 2021.

More information on the project can be found on www.peakevolution.ch

The Company

DDP Innovation was founded in 2018 with the goal to develop an electric multipurpose transport vehicle. It will be sold under the brand TERREN and it's built on the base of the existing Aebi VT450 Vehicle. It will be used in municipal service, Agriculture and in ski resorts.

The vehicle is supposed to enter the market end of 2022.

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DDP Innovation

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