

Field Report

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"Outstanding Reliability!" Traco Power DC/DC-Converters – the power behind the TUfast Eco Racing team

Run by the Technical University of Munich, the TUfast Eco Team offers engineering students the chance to get hands-on experience in developing efficient vehicles and the latest developments in electric mobility. The project aims to design and build an energy efficient Urban Concept vehicle and competes with it at competitions throughout Europe, including the Shell Eco-marathon. With their work, the team aims to create awareness of the importance of "green" mobility.

Over the past year, the sponsorship provided by power supply experts Traco Power has played a critical role, helping TUfast Eco to successfully develop an ecological Urban Concept vehicle with autonomous driving capability.

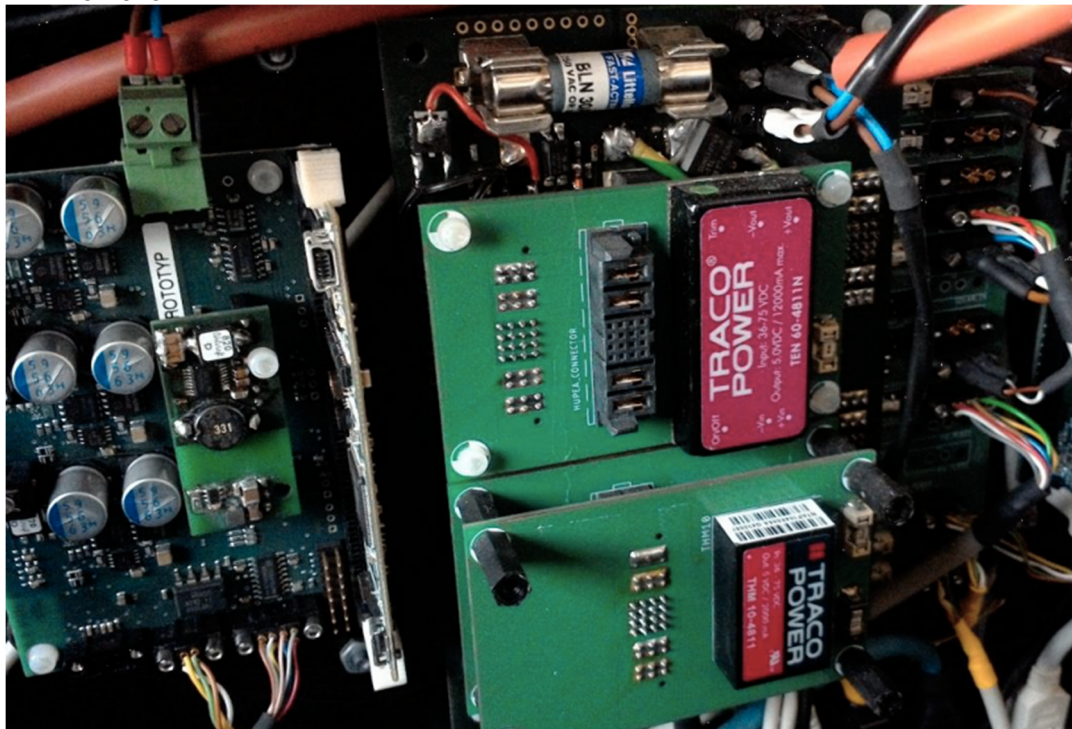


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Just as in previous years, for the 2018 season the **TUfast Eco team** put their faith in Traco power DC/DC-converters because they offer the diverse voltage levels needed to supply electricity for their car. The car is optimised to use the smallest possible amount of energy, so using high-efficiency converters is vital. During development, it's also important for the team to rely on a system that functions reliably – using a power supply can you rely on is fundamental to testing and optimisation.

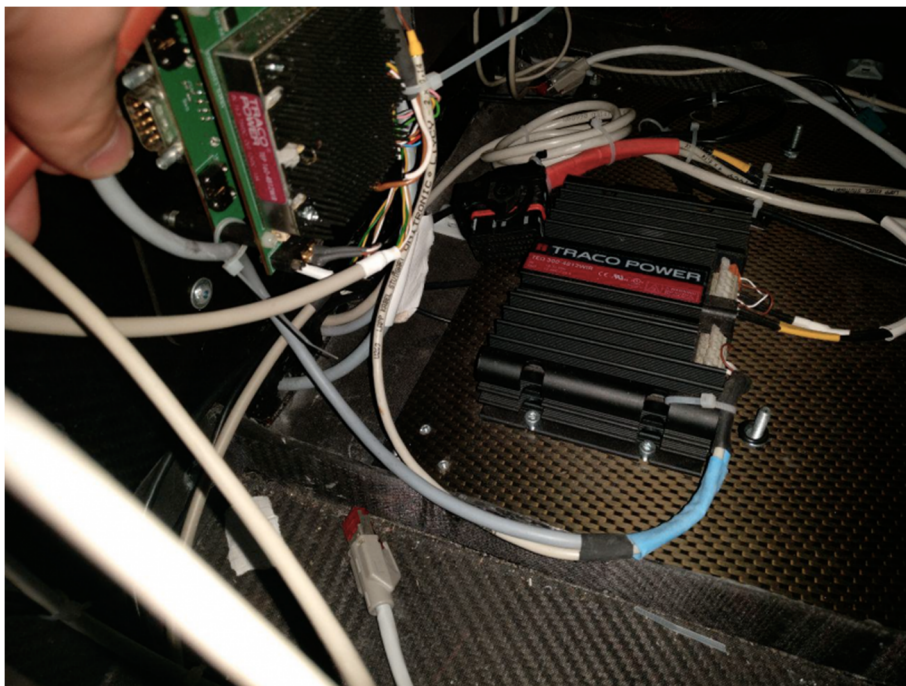
The wide input voltage range is ideal for running a vehicle off a battery because voltage can vary hugely according to the level of charge. It's also really important that the converters are tough – they are they exposed to dust and vibration in the workshop, and electronic faults during testing can also lead to short circuits. Because Traco Power DC/DC-converters are resistant to both of these they increase the safety of the whole vehicle.

In *muc018*, the eco-friendly vehicle for the 2018 season, the **TUfast Eco team** used Traco Power 5V DC/DC-converters (THM 10-4811) to power the board electronics, and LED lights, servo motors for the clutch and windscreen wipers were also powered by 5V converters (TEN 60-4811N - shown in the picture below - and THM 10-4811). The team used the 12V TEN60-4812N for the horn and the battery management system used the TVN 3-4819 to ensure self-sufficient power supply. Emergency shut off was powered by the TEP 75-4815WI.



Traco Power converters were also used extensively in the car's autonomous driving system. THM 10-4811 was used to ensure 5V power supply to circuit boards programmed with logic to switch the computer on and off and to trigger safety overrides for steering and brakes. It also powered the ultrasonic sensors needed especially for the "Parking Challenge". The TEN 60-4811N converter was reserved for even more power hungry components and of course, powering the car's computers is even more critical. For this, the TEP 160-4812WIR supplied 100W to a Dspace Autobox, just 10W to each of the Lidar sensors and also powered the logic for the steering motor controller - what's impressive about it is that it combines extremely high power with a small, PCB mounting enclosure and passive cooling by a heatsink. The TEQ 300-4812WIR (see image below) was used in the even more powerful PC used for image processing because offers great levels of reliability with a small factor.

Just as with the drivetrain, robustness and a wide input voltage range were important considerations – both systems were powered by one battery – and high levels of reliability are critical when powering the autonomous system because very expensive components are often sourced which the TUfast Eco team isn't in a position to repair. High load capacity while working at high operating temperatures (in competitions the vehicle can reach temperatures of between 40-50°C on the inside) is what originally made the project possible.



TUfast Eco Team 2018 Successes

Following a year of development and production, during which time the TUfast team completely redeveloped the car from new, they entered two international competitions. The contribution Traco Power DC/DC-converters made was significant and helped the team to put a reliable and successful vehicle out on the track.

At EducEco in Valenciennes, France, TUfast reached first place in their category and won the Urban-Concept category outright. At the start of July, the team also entered the Shell Eco Marathon and won the vehicle design award.

TUfast reached second place in the new Autonomous Driving Category, just a few points away from winning the category outright and were particularly proud of their performance in the Parking Challenge - watch the video to see the vehicle parking.

TUfast were the only team to master this challenge – the driver only remained in the vehicle for safety reasons, and is wearing highly visible white gloves because of that!

Traco Power converters are easy to integrate, reliable and robust, making them the perfect choice for the TUfast project and the team were delighted to have been supported by Traco Power as sponsors.

Find out more about the Traco Power product ranges used in *muc018*

- [TEQ300 series](#)
- [TVN3 series](#)
- [THM10 series](#)
- [TEP160 series](#)
- [TEN60 series](#)

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