



Winner of
the First European
Industrial Ethernet Award
&
Award Sponsored by
National Instruments at
Silverstone 2009 for Most
Innovative Use of an
Embedded System in the Car

www.sduvikings.dk



SDU Vikings - Racing Team - Electronics

Formula Student is a student engineering competition held annually in a number of countries. It is the largest and most successful of its kind in the world. Student teams from more than 400 universities participate in the event building, testing, and racing a small-scale formula-style racing car that is judged based on a number of criteria. The teams compete at one, or more, of the 8 events that are held throughout the world on racetracks like Silverstone, Hockenheim and the California Speedway.

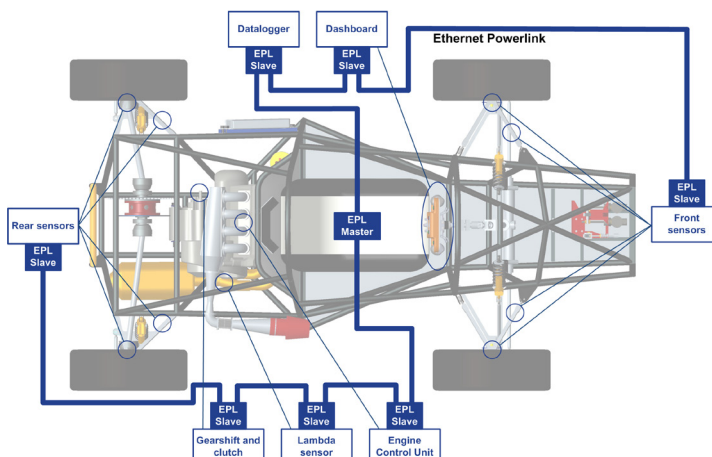
The competition is run by the Institution of Mechanical Engineers and uses the same rules as the original Formula SAE with supplementary regulations. The Formula Student competitions have been held at Silverstone Circuit, the home of British motorsport, for the past four years; the latest one took place on 15-18 July 2010.

Formula Student is not only an event for students fond of speed and adventure, it is also part of an education concept that is designed to maintain and enhance engineering students' interest in exploring the world of mechanics and electronics.

The Formula Students are trained in Engineering Design; Aesthetic Design; Sustainable Design; Production Design, Management, Fundraising, Presentation Techniques and Finance, all essential aspects of working in the field of engineering.

The Formula Student competitions bring international students together in a highly professional environment of networking and competition, making learning a matter of play and innovation, knowledge and teamwork, theory and hands-on experience.

The Maersk Mc-Kinney Moller Institute
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- *The electronics in the SDU Vikings racing car is created as a distributed system, based on the 100 Mb/s Ethernet POWERLINK real-time communication network. The network is designed to work as an extremely flexible communication platform and each unit is implemented into a FPGA, partly in plan logic and partly in softcore microprocessors as a system-on-chip solution.*
- *The system consist of different units each taking care of their own assignments – like:*
- *The engine control unit is in charge of everything regarding the engine, such as injection of fuel and ignition. It is possible to download different configuration modes to the engine controller unit at runtime in order to optimize the engine for various disciplines.*
- *The dashboard shows information to the driver during race, such as engine temperature and the gear the car is currently in. It is very flexible as the dashboard can easily display other parameters and change control settings of the engine. The dashboard unit also handles the gear and clutch paddles placed on the steering wheel.*
- *SDU Vikings will in the near future push development towards electrical racing cars, as an educational means to increase students' awareness about CO2 emission in the transportation sector.*



UNIVERSITY OF SOUTHERN DENMARK
Faculty of Engineering