

Press Release

New HiL Simulator for Fuel Cell Controllers: NovaCarts Fuel Cell

Simulation platform for the validation of Fuel Cell Control Units (FCCUs)

Vierkirchen near Munich, November 12, 2019: MicroNova has developed the “NovaCarts Fuel Cell” Hardware-in-the-Loop (HiL) simulator for testing fuel cell control units. NovaCarts Fuel Cell simulates the fuel cell stack as well as the environment of the associated control unit within the vehicle. It can be upgraded for future Fuel Cell Control Unit technologies by firmware update.

The versatile and scalable HiL system is ideal for validating new functions in Fuel Cell Control Units (FCCUs). Its modular design and numerous enhancement options allow the system to be adapted to various test requirements (e.g. power emulation / powerless simulation). The parameters and controllers used for each simulation can be modified directly in the software – eliminating the need for costly hardware replacement. In addition, firmware updates allow test engineers to easily and quickly adapt NovaCarts Fuel Cell to future requirements, such as new communication interfaces or updated HV architectures.

The HiL simulator uses an open model platform with cycle times of a few microseconds and high I/O dynamics. This enables the development of new FCCU algorithms as well as the use of real parts, dummy loads and rest bus simulation. In addition to the SAE standard J2799 for communication between vehicle and hydrogen filling station, resistance simulations can also be carried out to simulate temperature sensors with negative or positive temperature coefficients (NTC or PTC). The system behavior is supported by simulation models for fuel cells, thus enabling a closed-loop test setup.

Testing fuel cell stacks and traction batteries

In combination with the “NovaCarts Battery” HiL system, it is also possible to simulate functions of the connected battery such as State-of-Charge (SoC), and State-of-Health (SoH) controls, as well as cell balancing mechanisms. Further advantages of NovaCarts Fuel Cell include short and stable connections to the control unit as well as a fault simulation applied directly to the output, which ensures a high signal quality. The two test systems NovaCarts Fuel Cell and NovaCarts Battery combined can be used to test the complete fuel cell stack and the traction battery.

“With this new high-performance platform, we are specifically supporting the development of alternative and electrified drives,” emphasizes Martin Bayer, Head of Testing Solutions at MicroNova. “We attach great importance to a cost-effective and time-efficient application for test service providers and test departments in automotive development. For example, NovaCarts Fuel Cell HiL systems and NovaCarts components can be fast and easily configured thanks to the use of the same tool chain.”

Online Resources:

- www.micronova.de/fuelcell
- www.micronova.de

About MicroNova

MicroNova has been a software and systems vendor since 1987 and offers products, solutions, and services in three business segments: testing of automotive electronics, management of mobile radio and communication networks as well as the distribution of IT management solutions from ManageEngine. 280 experts work with technological competence and passion at the company's headquarters in Vierkirchen near Munich as well as at eight other locations in Germany and the Czech Republic. Numerous customers such as Audi, BMW, Continental, Telefónica Germany, Vodafone, and Volkswagen place their trust in the expertise of MicroNova.

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