

Flexible control solutions

A new vehicle management unit from a leading Canadian manufacturer of electric and hybrid powertrains has been designed to enable complete development customization

▶▶ A vehicle management unit (VMU, also known as VCU or ECU) serves as the vital nerve center responsible for the smooth operation of electric and hybrid vehicles. For OEMs and integrators, the development, testing and implementation of the right control algorithms can be a long and time-consuming process. Vehicle developers need flexible and convenient tools in order to reduce costs and bring their product quickly and efficiently to market.

Over the years, TM4 has expanded its product portfolio based on its customers' feedback about their existing solutions. It became clear that sourcing a component that interacts so closely with the powertrain from a single supplier makes a lot of sense from a development perspective. This drove TM4 to develop its first vehicle controller platform in 2009. Still, as the EV and HEV vehicle industry has matured, customers required even more flexibility and features. Incorporating more than five years of customer experience and feedback, TM4 recently launched a second-

The NEURO 200 fully programmable vehicle controller helps reduce development costs



generation vehicle controller hardware and software platform, the NEURO 200. Designed to be used as the central control unit of EV and HEV vehicles, it seamlessly manages the information flow between all components. Notable software enhancements have been made in order to simplify code generation, allowing for a wide range of development strategies. Customers can now choose anything from a fully programmable controller (OPEN), to a turnkey project that is ready to be used on the vehicle. If needed, rather than starting from scratch, users can

optionally purchase specialized TM4-developed application block sets for performance, comfort and driveability, in order to save development time and costs.

Another key area of software improvement is the new TM4 SynApps development platform that gives programmers complete development freedom. Operating in the well-known MATLAB/Simulink environment, all the advantages of model-based design are being met, such as simpler, faster development cycles and model re-use. This easy code generation gives users an undeniable edge for rapid prototyping purposes and reduces time-to-market by allowing them to fine-tune their algorithms as needed.

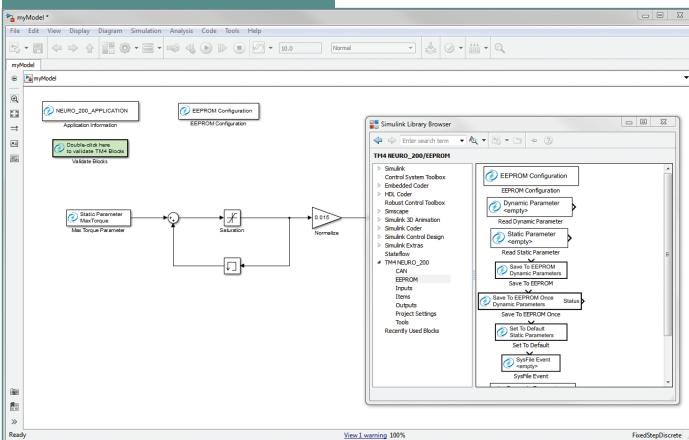
Significant hardware improvements have been made to meet the most demanding automotive standards. Notably, the NEURO 200 hardware platform is based on a rugged encapsulated printed circuit-board capable of operating in harsh under-hood vehicle environments. Significantly lighter and smaller than its predecessor, it offers four independent CAN ports and incorporates the latest 300MHz dual-core lock-step Texas

Instrument Hercules TMS570LC4 microcontroller. Optional features such as wi-fi, real-time clock and additional EEPROM offer the user more flexibility and control.

The NEURO 200 was developed concurrently with TM4's MOTIVE and SUMO powertrains, respectively targeting light-duty automotive vehicles and heavy-duty commercial vehicles. This means that this VMU can be used in a range of applications, from passenger cars operating in 12V environments, up to 24V commercial vehicles.

TM4 has over 15 years of experience developing complex control software solutions for a wide range of applications. Complete development service can be performed if required, as well as training and support for standalone developers. The NEURO 200 is produced at TM4's Canadian facility in Boucherville, which is equipped with high volume, automated, flexible production lines suitable for various electric powertrain components.

Based on MATLAB/Simulink, the new TM4 SynApps development platform gives programmers complete freedom



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