

CAN Newsletter Online

DEVELOPMENT PLATFORM

E-Mobility control solution

Synapticon has presented an e-mobility solution, which was specifically designed for the development in LEVs (Light Electric Vehicles). The modular control solution includes a built-in Bluetooth 4.0 LE + CAN module for communication.

SOMANET COMBINES COMMUNICATION AND MOTOR CONTROL in one platform. It is a product line from Synapticon's Dynarc platform for [cyber-physical systems](#). All solutions of the series are based on three components: COM, Core, and IFM. This solution consists of the built-in Bluetooth 4.0 LE + CAN module for communication, the Core module CA 11, and the drive DC 5000 as IFM (Interface Module). The communication modules (COM) allow the nodes to communicate with each other as well as with any other devices that are connected to the local network or the Internet. In the core of each node there is a processor module (Core), which is equipped with one or more XMOS and ARM processors. Local interface modules (IFM) are the connection to the physical world for each node. They fill the hardware gap between motors or sensors and their control processor.

CAN interface provided

The communication module COM Bluetooth is energy efficient due to the standard 4.0 LE (Bluetooth Smart). It serves, amongst others, for the integration of smartphones for in fitness apps, remote maintenance and updates of the control software via Internet, as well as for navigation etc. The CAN interface also allows the control of the battery management system and mechanical human machine interface components.

The Core module CA 11 consists of seven XMOS logical cores and an ARM Cortex M3 core. XMOS and an ARM architecture are combined in one chip. The XMOS cores allow the parallel execution of multiple software threads and offer native real-time determinism. This makes them suitable for real-time applications where sensor data, motor control, and communication are simultaneously processed in real time. An XMOS core is more than a micro-controller and can be used as a substitute for FPGAs (Field Programmable Gate Array) and DSP (Digital Signal Processor). The ARM core makes it possible to adapt software for specific applications, or the integration of the customer's existing software. A real-time operating system, FreeRTOS, is also provided and was designed to run on the ARM core.

The IFM module Drive DC 5000 – as third supplement of the Somanet module system – can provide up to 5 kW continuous power at a system voltage of 48 V for the operation of brushless DC motors. This includes not only e-bikes, but also slightly larger electric vehicles such as electric scooters, mobile robots, robot logistics, and golf trolleys as potential fields of application.

"The target group of the now showcased package – consisting of COM, Core and IFM – are manufacturers of electric vehicles and other low-voltage drive systems. For the volume production of LEVs subsequent to a prototype or small batch production based on the standard modules, we also offer modified, individual, cost-effective, and integrated solutions for the series production," explains Nikolai Ensslen, Managing Director of Synapticon.

Features

The complete solution, consisting of COM, Core, and IFM components, comes with a motor allowing control cycles up to 100 kHz. The system supports applications up to 5 kW in small spaces. The company says this solution enables accurate data capture and improved data processing between sensors and motor. Synapticon combines in its e-mobility solution communication and motor control in one solution. Customers can also run their own applications on the chip, such as custom software for special handling of the vehicle.



(Photo: Synapticon)



(Photo: Synapticon)



(Photo: Synapticon)

Ensslen adds: "Our Somanet platform is a cheap alternative for the development of eâ€mobility solutions. It allows a faster product development and thus faster timeâ€toâ€market. It also ensures greater efficiency both in development and production. During the development of this solution, we have been working with OEMs and automotive suppliers."

Synapticon, established in 2010, is an embedded systems company based in the region of Stuttgart, Germany. The company specializes in hardware and software for sensor and actuator-intensive internet-connected systems.