

Press Release, 21. April 2016

Fraunhofer IISB releases foxBMS, a universal, royalty free and fully open battery management system

Fraunhofer IISB is proud to announce the launch of its first generation, free, open, and flexible battery management system, namely foxBMS. At the conference “Batterietagung 2016” (battery-power.eu) foxBMS will be presented publicly for the first time. Visit us at Batterietagung 2016 on April 25-27 in Muenster, Germany, at the Fraunhofer Battery Alliance stand (booth 18). foxBMS will also be on show at the Fraunhofer IISB stand at the PCIM Europe 2016 from May 10-12 in Nuremberg, Germany. Currently, a total of 15 renowned industrial and research organizations from 7 countries worldwide have been selected from a long list of volunteers to participate in an intensive beta testing program. The public release of foxBMS, including all the hardware schematics, the software source code and documentation, is scheduled for the end of 2016. The system will then be available for download on www.foxbms.org.



Central control unit of foxBMS, the free, open, and flexible battery management system from Fraunhofer IISB in Erlangen. Picture: Fraunhofer IISB

Experience gained from international research and development projects over the last 15 years in the field of electrochemical energy storage systems at Fraunhofer IISB has been implemented in the electronic hardware and software of the foxBMS platform. The electronics is designed to manage high-performance prototypes of advanced and innovative lithium-ion battery systems of any size (i.e., from a few cells up to several hundreds of kWh and kW), especially for systems requiring the highest availability and safety levels. The free and open source version of foxBMS is not intended for immediate use in commercial products as they have to meet specific standards and require application-dependent certifications. In fact, foxBMS is a safe research, development, and test platform providing all functions for managing the complexity of state-of-the-art electrochemical energy storage systems. Specific adaptations of foxBMS can be ordered directly from Fraunhofer IISB or can be jointly developed with us for you, for example for automotive, aviation, space, submarine, industrial, and renewable energy storage applications.

Fraunhofer IISB delivers the first generation of its open source battery management system (BMS) research and development platform, foxBMS. The foxBMS platform is completely free



and open, designed for maximum flexibility, and comprehensively documented. It includes all necessary hardware and software for potentially any kind of mobile and stationary application that uses modern rechargeable electrochemical energy storage systems (e.g., lithium-ion batteries, redox-flow batteries, supercapacitors). The foxBMS hardware schematics and the layout of all electronic boards are available for download. The circuit design is based on commonly available components and devices, that do not require NDAs or confidentiality agreements. The foxBMS software toolchain uses only free of charge third-party software. The entire BMS source code is provided online with its own development environment and configuration files, enabling immediate use on Windows, Mac, and Linux operating systems.

With foxBMS you get a free and open BMS platform that can be used for developing and testing your products. The foxBMS hardware and documentation are licensed under the Creative Commons Attribution 4.0 International (CC BY 4.0) license. The foxBMS software is licensed under the BSD 3-Clause license. This means, foxBMS parts can be used unrestrictedly including commercial use. The foxBMS platform especially addresses R&D and test engineers requiring a smart, powerful, and well documented BMS platform. Engineering companies as well as small enterprises requiring a flexible and future proof BMS may profit from a maintained and supported BMS like foxBMS. Large enterprises asking for a reliable and safe BMS can use foxBMS for testing their prototypes. Research organizations requiring a simple and universal BMS development platform or students looking for a free and open BMS software development toolchain are welcome to include foxBMS in their projects.

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Fraunhofer IISB:

Founded in 1985, the Fraunhofer Institute for Integrated Systems and Device Technology IISB conducts applied research and development in the fields of power electronics, mechatronics, microelectronics and nanoelectronics. The work of the institute in power electronic systems for energy efficiency, hybrid and electrical automobiles as well as in technology, device and material development for nanoelectronics enjoys international attention and recognition.

In the business area of power electronics, the primary focus is on topics such as innovative circuit and system solutions for highly efficient and compact power converters, mechatronic 3D integration, multifunctional integration and use of new materials and semiconductor devices. Application fields include e.g. electrical energy transmission, drive technology, switching power supplies and voltage transducers, components for vehicle technology and vehicle models, construction and connection technology for passive and active power modules as well as lifetime and reliability tests. Fraunhofer IISB additionally has extensive experience in the area of error analysis. This applies to all levels of electronic circuits, from chips to chip contacting, housings and circuit carriers or insulation substrates, up to passive devices.

Around 230 employees work in contract research for industry and public institutions. In addition to its headquarters in Erlangen, the IISB also has two further locations in Nuremberg and Freiberg. The IISB closely cooperates with the Chair of Electron Devices at the Friedrich-Alexander-University Erlangen-Nuremberg.

Images for editorial use can be found at www.iisb.fraunhofer.de/presse.