Battery and charger communication

Members of the nonprofit associations CiA and Energybus have developed the CiA 454 profile for energy management in pedelecs. Recently, the second version has been released.

Get-together after the official release of CiA 454 version 2.0 (Photo: Energybus)

THE JOINTLY DEVELOPED PROFILE SPECIFICATION specifies mainly the communication between battery and charger. The Energybus organization will use this CANopen communication especially for light electric vehicles including pedelecs – battery-powered bicycles (pedal electric cycle). The partners have already submitted the relevant parts to IEC/ISO for international standardization (IEC 61851-3). The standardization is important for the development of public charging stations. This includes a connector and CANopen communication.

The official release of the CiA 454 profile version 2.0 took place in the Emtas facilities in Merseburg (Germany). Emtas is one of the active parties who developed the specification.
The company provides also a CiA 454 starter-kit and designs a CiA 454 test-tool on demand of the Energybus association. CANopen hardware for CiA 454 devices is available from Pironex. The hardware is used in public charging stations in several German cities (Bremen, Chemnitz, Hanover, and Rostock). The company also offers an Energybus CAN-logger device and other products supporting the CiA 454 specification.

Get-together after the official release of CiA 454 version 2.0 (Photo: Energybus)

Not just for batteries

Hannes Neupert from Energybus said: “The idea for a unified standard came about as part of work being carried out for the electric bike fleet of Deutsche Post AG in the early 2000s. In 2004, the idea of Energybus was introduced for the first time at the LEV Conference in Taipei, and in 2009, the first connector for it was presented. Now, with the significantly extended version 2.0 of this communications protocol the era of industrialization of the Energybus can begin. Several of the over 60 member companies already have Energybus compatible products in their range - and many more are under development.”

The CiA 454 protocol doesn’t just define communication between charger and battery. In fact, it’s also valid for communication within the bike itself. So bike components, starting with the drive, going on through sensors and the power management system, and ending with the user display, can all communicate with each other. Furthermore, the protocol also enables software-activated immobilization of bikes via a charge-and-lock cable, in a manner similar to a car immobilizer.

Get-together after the official release of CiA 454 version 2.0 (Photo: Energybus)

Hannes Neupert reported that Energybus and VDMA have agreed to standardize networked batteries for forklifts based on Energybus: “With this collaboration we are living up to our principles of encouraging innovation and competition in the open market. When it comes to the ‘Modular Multi-Use Battery Systems’ project that means making the standard accessible to even more sectors and customer groups.” Bernhard Hagemann from VDMA added: “This collaboration will enable us actively to bring know-how and experience from Energybus in the field of communication in energy systems to the development of standards for high-performance modular batteries. That is very worthwhile and an important step forwards.”

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