Controlling battery charging with CAN

The IC650 industrial battery charger by Delta-Q Technologies (Canada) is now available with CAN communication functionality. CAN facilitates communication between the charger and other electric drive vehicle or machine devices.

The IC650 charger “Comm” version supports CAN network programming, as it offers a port for the signaling cable harnesses (Photo: Delta-Q)

THROUGH CAN, ON-BOARD CHARGIN OF LEAD ACID and lithium battery packs is enabled. The charger is available in 24 V_{DC}, 36 V_{DC}, and 48 V_{DC} models and provides 650 W of constant output power. “Comm” versions of the charger offer the necessary communication port to support CAN programming. The implementation of the CAN network uses an isolated CAN physical layer with a CANopen protocol stack. The company currently supports the CiA 419 (charger) CANopen device profile, with plans to implement the CiA 454 (light electrical vehicles) device profile. It has also added manufacturer specific parameters to allow greater control and monitoring by external systems. Using an isolated CAN implementation simplifies the system integration process, as it provides original equipment manufacturers (OEMs) with the flexibility to reference whatever voltage potential is convenient for them (e.g. battery positive or battery negative). CAN functionality can be used in both an on- and off-board implementation of the charger.

The charger features a USB host port, allowing future updates to the charger’s software, charge profiles and CAN programming to be implemented by inserting a pre-programmed USB flash drive (Photo: Delta-Q)

When the charger is used in lithium applications, it is a slave to the battery management system (BMS), with the BMS monitoring individual cell voltages and temperatures and controlling the charging process. This monitoring and control prevent overcharging and ensure that the battery cells remain balanced. Many OEMs of golf cars, lift trucks, aerial work platforms, floor machines, utility vehicles, and scooters are developing machines that employ lithium batteries. Lithium batteries are being considered for deep cycle applications because of their energy density, and reduced size and weight (compared to lead acid batteries). Safety concerns associated with lithium battery usage create the need for a highly integrated system using a charger with CAN functionality.

CAN functionality can also be used in lead acid battery applications. In these applications, the charger charges the batteries independent of other vehicle components, but charger information is communicated over the CAN network to be used by other CAN devices (e.g. the main vehicle controller) to operate display panels, safety interlocks or provide data collection to custom service tools.