

Battery Management: Altech's Versatile Charging Solutions

Murray Slovick

Efficient, rechargeable and economical battery systems are needed in a wide variety of industries. Uses can range from generator sets to transceiver base stations, from onboard chargers for electric vehicles to water pumps. Proper recharging and maintenance of these batteries requires an intelligent charging system that can vary the charging voltage based on the state of charge and use of the battery. And while these battery chargers can differ in terms of design and the battery chemistry they are suited to, with proper selection and use, a battery charger can restore even a flat industrial battery to a fully charged state.

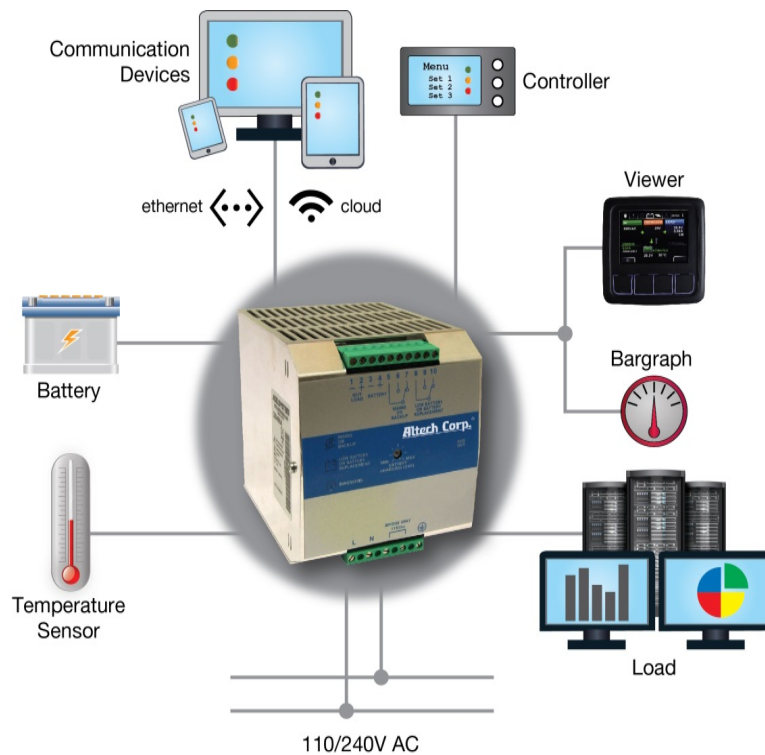


Figure 1: Charging flow diagram. Source: Altech

Equipped with Microcontrollers

Altech's multi-stage battery chargers operate automatically and are well-matched to the most advanced requirements of battery manufacturers. Real-time diagnostics allows for fast recharge and recovery of deeply discharged batteries and enable the user to monitor battery faults, disconnections and charge status. In addition, they will monitor the ambient temperature and adjust charging parameters accordingly.

Each device is suited for a wide variety of battery types. By means of jumpers, it is possible to set predefined charging curves for open lead-acid, sealed lead-acid, gel, nickel-cadmium (Ni-Cd)

and nickel-metal hydride (NiMH) batteries (as an option). It is possible to change or add other charging curves by connecting the device to a portable PC. Similarly, it is possible to carry out functional software updates just using any laptop computer. Doing so allows the system to always be up-to-date with changing requirements.

Altech smart chargers will detect voltage and resistance from the battery prior to charging, and then stop the charging cycle automatically when a rechargeable battery is fully charged. The company's CB series battery chargers are based on switching technology that allows much higher efficiency (up to 91 percent), as well as smaller and lighter devices than is possible with traditional linear technology battery chargers. What is more, standard safety and protection features ensure safe installation and operation. The bus system included with many of these products satisfies all ModBus 485 protocols and CAN bus J1939 bus protocols for connection to GenSets.

CB Series Battery Chargers: A Closer Look

In its CB series, Altech offers a highly reliable battery management solution operating at single phase, with wide input voltages of 115-230-277 V AC and supplying an output of 12 V DC and up to 35 A, 24 V DC and up to 20 A and 48V DC up to 10A.

CB series chargers feature three charging modes (Figure 2): recovery, boost and trickle, each

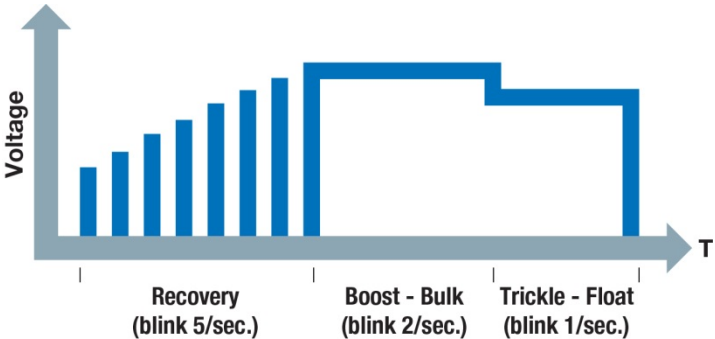


Figure 2: Graph depicting the three charging modes of a CB series charger. Source: Altech

identified by a flashing code on an LED. In recovery mode, the unit can recharge and completely recover severely drained batteries, even when their voltage is close to zero. Recovery mode is indicated by an LED blinking five times per second. Boost is the fastcharge mode. To indicate boost mode, the LED blinks twice per second. The float stage then brings the battery all the way through and maintains a

100 percent state of charge. The current will also decrease to a point where it's considered a trickle (that's where the term "trickle charger" comes from). To indicate float charging mode, the LED blinks once each second. During trickle charge, the quality (resistance) on the battery connection is checked every 20 seconds. When the battery is completely full, the device automatically switches into trickle charging mode.

The CB series features real-time auto-diagnostics for monitoring battery faults and disconnections. A flashing LED sequence code allows users to discriminate among various possible faults. For example:

- One flash: Reverse polarity, wrong battery voltage.
- Two flashes: Disconnected battery.
- Three flashes: Battery element in short circuit.
- Five flashes: Battery to be replaced (internal impedance is bad or bad battery wire connection).

This high performance battery charger and DC UPS product meet with a wide variety of applications such as machine building, system manufacturing, building automation, ship building, process technology, building safety, oil and gas metering, and equipment safety requirements.

Power Continuity: The CBI All In One Series

Altech’s CBI All In One UPS Power Solutions combine the requirements for several applications in just one device that can be used as a power supply unit, battery charger, battery care module or backup module. The available power is automatically distributed among load and battery; it should be noted that supplying power to the load is always the first priority. Continuous monitoring of battery efficiency reduces battery damage risk and allows safe operation. Like the CB series, CBI devices are suited for a wide variety of battery types: open lead-acid, sealed lead-acid, gel, Ni-Cd and NiMH.

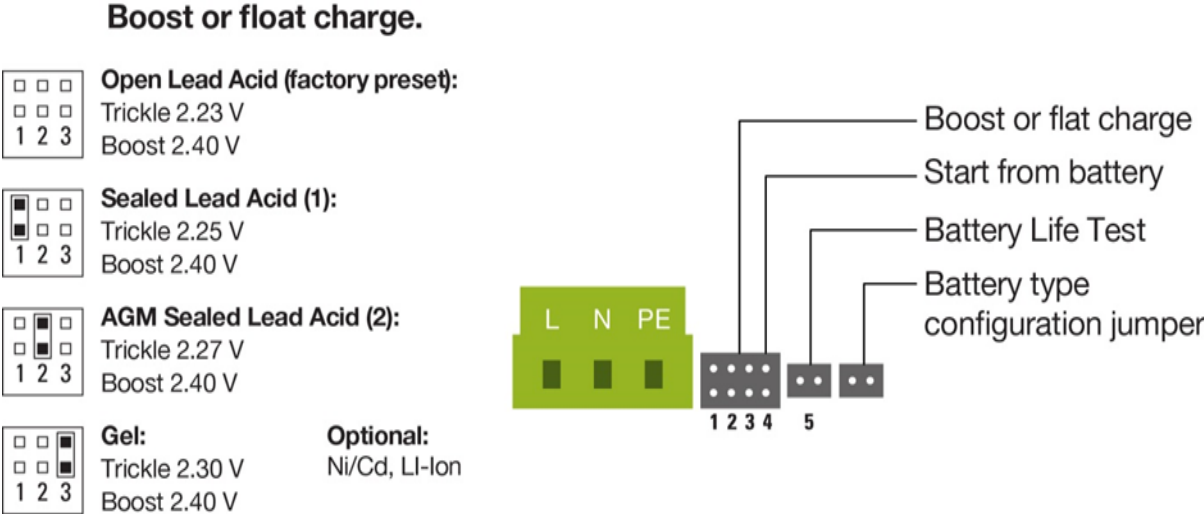


Figure 3: CB charger LED codes. Source: Altech

The available charging options are recovery, boost and trickle charge. Also, as in the CB series, CBI devices provide microprocessor-controlled battery charging. Using algorithms, the battery's condition will be detected and the appropriate charging mode is chosen.

Load output will not be affected by battery conditions. The DC-UPS ensures continuous power supply to the load even in conditions of completely discharged batteries. Its automatic, multi-stage operation optimizes and adapts to the battery status. The CBI series real-time diagnostics system continuously monitors charging progress and provides a flashing code of the diagnosis.

Conclusion

Altech's CBI Series product meets the highest standards of quality and ensures high reliability with MTBF values of up to 300,000 hours.

With a variety of battery chargers available on the market, it is important to choose the charger best-suited to your application. [Visit the Altech website for more information](#) on high-quality, microcontroller-based battery chargers and DC UPS solutions.