

An All-in-One DC UPS power solution

By Murray Slovick



Figure 1: Altech's CBI UPS power solution combines several applications in just one device. Source: Altech Corp.

Altech's CBI "all-in-one" UPS power solution offers a unique approach to backup power, combining several applications in just one device. It can be used as a power supply unit, a battery charger, a battery care module or a backup module.

Each device is suited for all common battery types: open/sealed lead acid, lead gel and Ni-Cd (Ni-MH and Li-ion batteries by means of jumpers). Other charging curves can be loaded into the device from a laptop.

While the available power is automatically split between the load and battery, supplying power to the load is always the priority. The maximum available current on the load output is twice the value of the device-rated current.

These units accept a wide range of input voltages, such as 120, 230 and 277 V AC, which makes the product usable anywhere in the world without any additional settings. A high voltage input version for 400 and 500 V AC is also available. Output voltages are assigned, or can be selected before installation for any voltage between 12 and 48 V DC.

Altech's "Battery Care" philosophy is evident in the CBI series. This is based on algorithms that implement rapid and automatic charging, battery charge optimization, flat battery recovery and real-time diagnostics during installation and operation. Battery faults such as elements in short circuit, accidental reverse polarity connection and battery disconnection can easily be detected, identified and removed. Anomalies are indicated through a battery fault LED that provides a flashing code of the diagnosis.

Charging modes are also indicated by the LED:

- Recovery (five blinks per second), able to recharge batteries even when their voltage is close to zero
- Boost — Bulk (two blinks per second)
- Absorption (one blink per second)
- Trickle — Float (one blink per two seconds)

And it gets even better — much better if concerns include the risk of battery damage. CBI devices provide a high efficiency value of up to 91% through state-of-the-art switching technology and microprocessor-controlled battery charging. Microprocessor-controlled charging also means that the system is constantly monitored, reducing the risk of battery damage and allowing safe operation in permanent connection. Every 60 seconds the system checks battery connection; in trickle charge and every 220 minutes it tests battery efficiency. Continuously testing the internal impedance status avoids any possible risk of damage.

CBI power supplies can be paralleled for redundancy to obtain a higher system availability or to double the power of a single unit. It is possible to connect as many units in series as needed, providing the sum of the output voltage does not exceed 150 V DC. In operation, one unit is configured as Master and the other as Slave; user interface elements (jumpers, charging level trimmer, start button, thermal sensor and relays) must be used on the Master only, not on the Slave. In this configuration mode, only the Master device displays status via the LED indications.

If a device is disconnected from the main power source, or in case of mains failure, the battery will supply the load until battery voltage reaches 1.5 Vpc (volts per cell). Below this level the device automatically switches off to prevent deep discharge and battery damage.

In most cases the system can recharge deeply discharged batteries even when their voltage is close to zero, thus allowing for recharging and complete recovery of flat batteries. 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.

Altech's communication platform uses a single protocol based on the CAN2.0 standard. This allows units to communicate with all the accessories provided by Altech at the same time. It allows monitoring and control of all parameters in the system, from anywhere in the world, by means of application tools on the cloud.

With a variety of battery chargers available on the market, it is important to choose a charger best-suited to a specific application. Altech's CBI Series ensures high reliability with mean time between failures (MTBF) values of up to 300,000 hours. A rugged casing with bracket for DIN rail mounting provides IP20 protection (protected from touch by fingers and objects greater than 12 millimeters).

Visit the Altech [website](#) for more information on its microcontroller-based DC UPS solutions.