

# Automated Functional Testing of Battery Pack Monitoring Circuit Boards for Plug-in Hybrid Electric Vehicles



## Customer:

A supplier of customized power solutions for a wide range of energy needs, including Hybrid Electric Vehicles.

## Challenge:

Design and build a functional test system for two versions of circuit boards which intelligently monitor and control multi-cell battery packs used by Plug-in Hybrid Electric Vehicles.

## Solution:

Bloomy Controls produced a custom turn-key system which programs and tests each UUT that comes off of the production line. The system uses 12 power supplies which simulate the cells of a battery pack. The products communications (UART and/or CAN), voltage sense accuracy, battery control and safety systems are all tested. To reduce operator interaction, testing of the product starts after scanning a serial number.



## Results:

**Bloomy Controls developed a common test platform with interchangeable fixture heads which significantly reduces the cost and lead-time for developing new board tests.**

By automating the test processes such as cell voltage modulation and measurement, current measurement, UUT communications, board programming and data logging the system dramatically reduced test time while increasing test coverage. Having interchangeable fixture heads generates a significant cost reduction by allowing the reusability of expensive resources such as data acquisition hardware and power supplies.

## Features:

- NI-9172, 8-Slot USB 2.0 CompactDAQ Chassis:
  - 9205 ( $\pm 10V$  AI)
  - 9263 ( $\pm 10V$  AO)
  - 9401 (TTL DIO)
  - 9472 (24V DO)
- Bed-of-Nails fixtures
- Barcode Scanner
- Interchangeable fixture heads for different UUTs
- Serial UART and CAN Communications
- 12 Power Supplies simulate battery cells
- In Circuit Programming using NI LabVIEW
- Simple, intuitive user interface

### Headquarters:

839 Marshall Phelps Road  
Windsor, CT 06095-2170  
Tel: 860-298-9925  
Fax: 860-298-9535

### MA Office:

257 Simarano Drive  
Marlborough, MA 01752  
Tel: 508-281-8288  
Fax: 508-281-8295

### NJ Office:

2125 Center Avenue, Suite 402  
Fort Lee, NJ 07024  
Tel: 201-944-9890  
Fax: 201-944-9892