

By Ashish Uttarwar

Battery Management System (BMS)

A battery management system is any electronic system that manages a rechargeable battery, such as by protecting the battery from operating outside its Safe Operating Area, monitoring its state, calculating secondary data, reporting that data, controlling its environment, authenticating it and / or balancing it.

Freese Enterprises Inc., Michigan, USA

As a full service test system integrator with over 26 years of experience, Freese Enterprises, Inc. (FEI), is well positioned to address any engineering requirements. Knowledgeable staff with experience to design and install complete turn-key test systems, both manual and automatic. In addition, FEI has experts in electrical and mechanical engineering to design and develop customized industrial hardware and software. Typical solutions combine off-the-shelf computer systems and equipment with custom application software, fixtures, and enclosures to construct complete test systems.



Industry
Automotive

ARAV Systems provides software consultancy and development services particularly using NI hardware and software products.

Testimonial

“FEI used ARAV team to create the software for an Automated Functional Tester for A123 Systems for their 48V and 12V BMS Modules. The software required a LabVIEW User Interface, TestStand for the Sequencing, and Teststand/LabVIEW based code modules. ARAV team worked hard to complete the software in a timely manner, communicated effectively, and were very easy to work with. ARAV team engineers were highly capable and effective even though we were a great distance apart. FEI would use them again for future projects.”

- Mark Williams, Freese Enterprises Inc, Michigan, USA



Objective

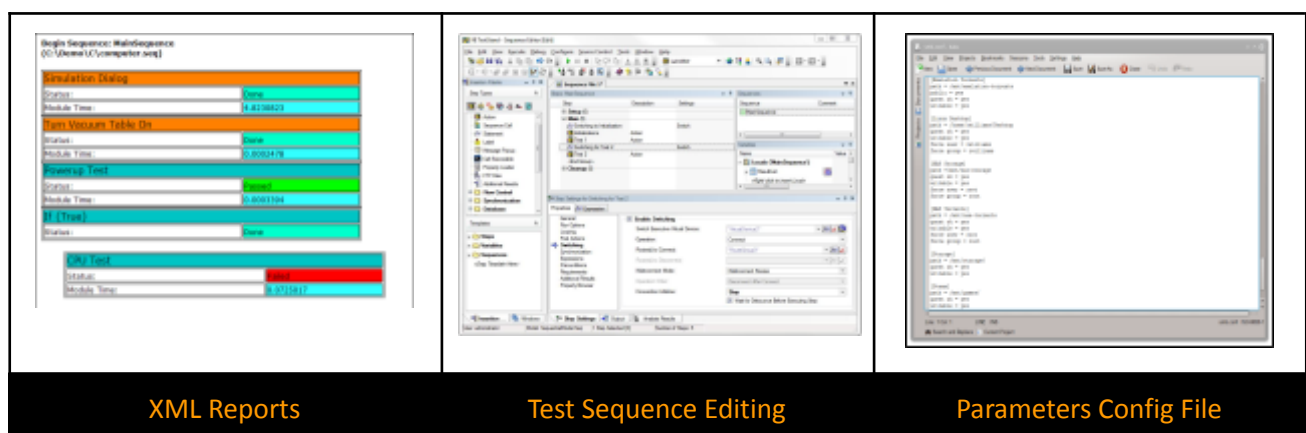
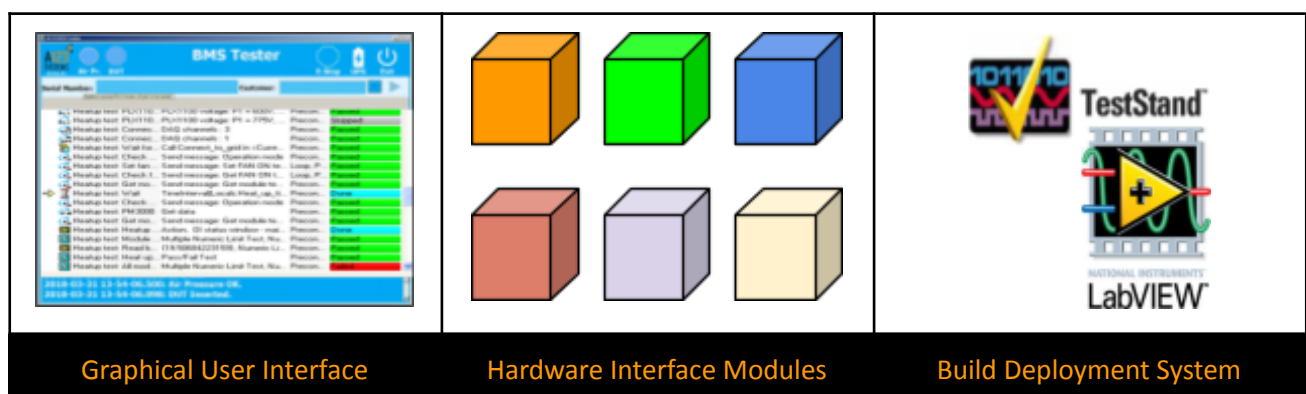
Develop a software framework that will allow leveraging off the shelf software and hardware components. At the same time, have provision to integrate custom modules as per the DUT design changes.

Challenge

During the *Design Validation (DV)* Stage of BMS, there is need for a robust and reliable platform that allows for flexibility to change test parameters and test sequence as per the changes in the design of the *Device Under Test (DUT)*. The system should allow us to leverage all the understanding from *DV* stage and build a *Production Test* system. This will speed up the development of the *Production Test* system and also cut down on the hidden costs associated with developing a system from scratch.

Approach

Develop a decoupled framework between User Interface, Test Sequence and Hardware Interface Modules. This ensures that the end user gets to leverage the flexibility of modifying/improving the test sequence as needed.



Highlights

- Object Oriented Approach for creating Hardware Interface Modules and their Simulation Modules
- Software Development using Simulation Modules for Hardware allowing for parallel development of hardware and software
- Configuration driven testing for a convenient way to modify pass/fail criteria as well as skip desired tests.
- XML report for easy integration with manufacturing database systems.
- Intuitive User Interface that provides real time status of the test results and overall system
- Current & Voltage Calibration Routines
- Simulate total 14 Cells of the Battery
- CAN and LIN communication capabilities with the Device Under Test (BMS)
- Supports BMS Variants 12V 60A, 12V 40A and 48V

Future Development Plans

- Over the period, build Hardware Interface Library that will allow for quick turnaround time to develop a custom test and measurement system as per customer requirements
- Develop a reusable framework with templates for creating custom modules for new hardware interface

Our Company Profile

- NI Engineering Impact Award (India) winners in 2014 and 2015
- We provide software development services for Test & Measurement, Process Automation and System Integration projects



Contact Us

contact@aravsystems.com

www.ARAVSystems.com