

## ELECTRIC VEHICLE TEST CELL CONTROL AND DATA ACQUISITION SYSTEM

### SYSTEM OVERVIEW

The advanced software is designed to address many of the issues faced by a busy and technically demanding test environment including powerful features to support efficient test configuration and deployment:

- Intuitive user friendly interface and workflows.
- Ability for high speed synchronous data acquisition and logging (up to 200kHz - requires specific hardware options/support).
- Standard 1kHz loop rate for model execution, IO update rates and datalogging.
- Flexible to support multiple high-speed deterministic model formats including MATLAB/Simulink, AVL Boost and Cruise, Technalia DynaCar, IPG CarMaker, LabVIEW, as well as less demanding applications e.g. battery test. Simply import new models as compiled DLL and map inputs and outputs.
- Simple and fast to deploy standard scripts or create new scripts via Python scripting tool and support library or real-time sequence wizard.
- Supports long continuous test durations with built-in real time sequencer (when based on headless real time system).
- Change and manage test cell configurations from a single interface.
- User level-based access.
- Dynamic user Interface that can be reconfigured in tests removing the need to restart.
- Apply application-specific safety protection models.
- Open extensible architecture. Add new sensors, or bespoke protocols via a simple low-cost, 'plug-in' upgrade or import via built in template. The new custom device is automatically verified, packaged and deployed down to the real time controller.
- Wide range of standard comms buses are supported such as: High Speed CAN bus up to 1 Mbits/sec, Ethernet up to 1000BASE-T, Generic RS-232, EtherCAT, CANopen, Profibus, FlexRay, LIN (please note that many of these require specific interface cards).

- Low cost entry level.
- Quick and easy to deploy, configure and replicate.
- Faster development times with automation and collaboration.
- Open platform for greater modularity, flexibility, model integration and custom sensors.
- Complete test coverage achieved with a flexible platform for accurate and innovative test systems.
- Straightforward Integration with existing systems.
- Adaptable to rapidly accommodate changing/future requirements therefore reducing costs and complexity.
- Proven expertise in this field.

### TEST APPLICATIONS



2WD / 4WD E-AXLE



E-MACHINE DYNO



E-TRANSMISSION



MOTOR EMULATION



DYNAMIC SPIN RIG

## A Complete Scalable Solution for Deterministic Real-time Testing of Components or Full Electric Vehicle Powertrain

Based on the NI platform the software is designed to offer maximum flexibility and extensibility to integrate across any hardware configuration, and with a deterministic real-time test engine at its heart, the system can run high-speed models and close the loop with real sensor data at rates upwards of 1 kHz.

### Platform Add-ons

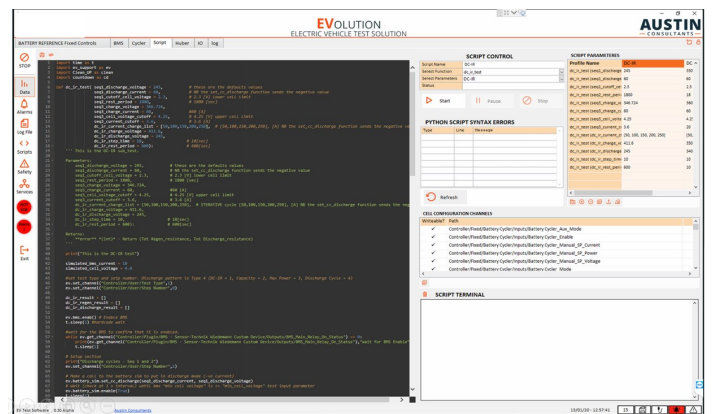
The EVolution Add-ons have been tailored for either Battery Test or Dyno Test and provide a number of features and plugins to greatly reduce the up-front set up and development timescales required to get the system up and running. As part of the add-on the device plugins\* (also known as custom devices) are ready to import and deploy down without the need of any additional LabVIEW development. The generic test scripts provided are a great starting point for the automated testing and can be used as provided or as a solid foundation for further customisation to create a bespoke test.

The add-on packages also include application specific user interface widgets, protection models and application specific fixed device definitions, which enable the system to abstract some common tasks to simpler interactions.

\*Plugins proven on specific device models and may require specific communication interface cards.

### Evolution Dyno Add-on

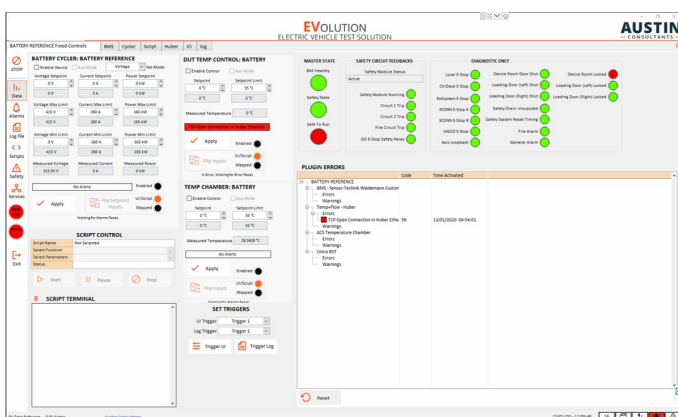
- Specific dyno protection models and fixed device definitions applicable to testing using dynos.
- Dyno Plugin - proven EtherCAT device plugin for Unico drives, but also ABB\*
- Generic CAN Inverter Plugin with wizard based UI to reduce the time required to add a new DUT to the system
- DUT Chiller Plugin Device - currently supports Huber\* or Lauda\*
- Power Analyser Plugin - currently supports N4L\* and Yokogawa\*
- Dyno/DUT Protection Models
- Battery Simulator Plugin - currently supports Unico\*, Regatron\* or Bitrode\*
- Example Python Scripts for the following tests (including industry standard tests):
  - Open circuit - no load losses test
  - Short circuit - current losses test
  - Torque production and vibration testing
  - Linked axis testing
  - Drive cycle test
- Application specific user interface widgets.



PYTHON SCRIPTING TOOL

### Evolution Battery Add On

- Specific battery protection models and fixed device definitions applicable to battery testing
- Device plugin in for Unico EtherCAT Battery Cycler\*
- Generic Battery Plugin device with a wizard based UI to reduce the time required to add a CAN based Battery pack/BMS to the system.
- Environmental Chamber plugin in device - currently supports ACS Chambers\*
- DUT Chiller Plugin Device - currently supports Huber\* or Lauda\*
- Generic Python Scripts for the following standard battery tests:
  - DC-IR
  - Capacity
  - Max Power
  - Endurance Cycle - Playback of a CSV file
- Application specific user interface widgets.



TYPICAL USER INTERFACE

Please contact our team to discuss your test requirements.

austinconsultants.com | 0800 772 0795