

Rapid Prototyping Electronic Control System (RPECS™)

Southwest Research Institute's® (SwRI) Rapid Prototyping Electronic Control System (RPECS) is a powerful, reconfigurable, crank-synchronous platform capable of high-speed data acquisition and real-time engine control. RPECS includes a wide array of modular hardware and software that can be combined to fill complex research and prototyping needs. Built on more than 20 years of test and engine control technology, RPECS is the latest in a successful line of expandable, rapidly customizable, high input/output (I/O) count, prototype control systems.

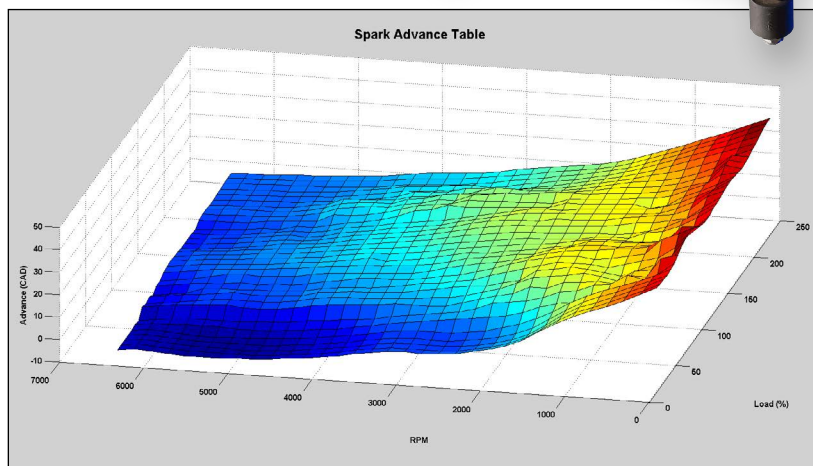
With the flexibility RPECS offers, crank-synchronous data acquisition can be performed on a stock engine control unit to produce steady-state calibration maps, which can then be used in either SwRI's open-source engine control software written in Simulink® or the customer's control software, on RPECS or any other controller.

SwRI's RPECS is an extremely flexible tool that helps engineers address some of the most difficult powertrain control challenges.

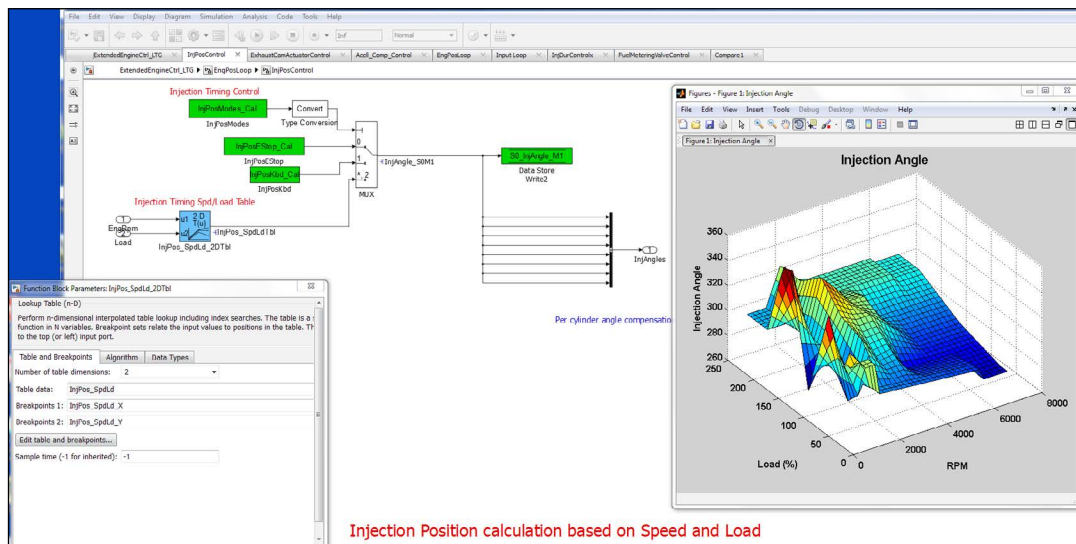
Base Level Features

- Calibration through ATI Vision (XCP)
- Supports running MATLAB® and Simulink models
- QNX RTOS – Full Unix server functionality
- Crank-angle or time-based data acquisition
- Customizable CSV file format for data logs
- Two CAN channels
- 32 differential analog channels
- Timed and engine synchronous I/O
- Flexible power supply input
- Test cell and vehicle mountable
- Sealed, rugged enclosure
- Passive cooling
- Reliable, commercial off-the-shelf (COTS) hardware
- Custom signal conditioning for automotive sensors and actuators

Each SwRI RPECS system is highly customizable to meet unique customer needs. The configuration outlined in this data sheet is the standard, expandable foundation for prototyping solutions.



RPECS, as a crank-angle benchmarking tool, produces steady state control maps and captures transient response.



Injection Position calculation based on Speed and Load

RPECS is a flexible control system using SwRI's engine control software in open-source MATLAB Simulink.