Micro Engine Control Unit (µECU)

Description

Southwest Research Institute’s® (SwRI®) Micro ECU (µECU) is an advanced programmable controller architecture, which can be rapidly and cost-effectively customized for your specific powertrain application.

SwRI engineers leveraged a commercially available microprocessor “system on module” and integrated it with custom I/O signal conditioning to produce an ECU capable of controlling diesel fuel injectors for UAV applications. The initial design successfully controlled the UAV engine at various speed-load points and through transients in the test cell.

The current hardware setup already includes I/O for up to four cylinders of a GDI or DI engine. The design is intentionally flexible with additional I/O available on the microcontroller. The controller’s carrier card can be quickly customized to exact specifications by our Ann Arbor Technical Center.

SwRI’s MATLAB/Simulink®-based engine control software package is available to further expedite development programs. SwRI's client-friendly intellectual property policies mean this rapid prototyping tool can also enable your path to production. Technical support is available for engine setup and calibration in your test cell or ours.

Features

Powertrain control capabilities
• Spark ignition
• Compression Ignition
• Other powertrain applications

Modern automotive engine control processor
• Freescale Qorivva (32-bit floating point)

Multiple programming methods
• MATLAB/Simulink/C

Timed and engine synchronous I/O

Graphical user interface/calibration tool

Input options
• VRS or Hall effect (cam, crank, turbo)
• Analog inputs (12-bit)
• Digital inputs

Output options
• Peak and hold injectors (GDI/DI/PFI capable)
• Ignition drive
  ▪ 5V smart coils / integrated igniter
  ▪ IGBT coil drive available
• Low side relay drivers
• 5A H-Bridge electric throttle(20A high power available)
• PWM solenoid outputs (EGR, WG, VGT, VVT etc.)

Dual 1 Mbps CAN

12V DC nominal power (6-30V DC)

Small vehicle mountable package

Environmentally sealed
• Splash and dust-resistant enclosure
• Sealed 50 pin ‘D’ connector