

Mark I Engine Simulator

Overview

The Mark I is an intelligent engine simulator for use in engine controller development. It supplies all the necessary input and output functions, including J1850 and CAN messages, to allow an Electronic Control Unit (ECU) to operate without the vehicle. It also provides powerful real time data acquisition and measurement capability. All functions are under computer control and are accessed via the Graphical User Interface (GUI).

Architecture

The system contains a real time, VME-based I/O subsystem and a PC-based interface. The VME I/O subsystem handles all real time control functions related to the physical I/O of the system. The 20-slot VME rack contains digital and analog I/O cards that can be selected to meet the needs of a particular system. Two auxiliary racks provide signal conditioning for the raw incoming signals. The majority of these cards are industry-standard VME products.

The PC is equipped with a standard Windows 2000 operating system to provide the user with an intuitive interface to view the simulation experiment as it happens. The GUI allows the user to adjust variables and set conditions on the fly. The entire process of running an experiment can be recorded. Every keystroke, button push and encoder adjustment can be recorded and played back later.

Adjustments to settings may be made using either the PC's mouse or keyboard, or through the supplied I/O box that provides switches, encoders, LEDs, and a four-line vacuum fluorescent display. All of the I/O box functions are "soft" and can be reassigned to any variable.

The breakout panel provides convenient access to I/O signals. Each signal may be individually disconnected, interrupted, or probed by the user.

In addition to an LCD monitor, information is available on two LED wings located on either side of the monitor. There are also software assignable LEDs on the I/O box.



The system has several bays for customized load trays meeting the I/O requirements of various ECUs. These trays are easily removed and mate to a system interconnect board. The interconnect board provides a convenient routing mechanism for the large number of interconnection points for various higher pin count ECUs.

Scripting

Scripting software allows the user to create test scripts to control every parameter in the controller environment. Tests may be designed before the physical ECU is available. Scripts may be easily modified, altering the test sequence to further investigate hardware or software issues.

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