



DGE Featured Product

Telematics Vehicle Drive Simulator

Features

TCU (ECU) Interface

GPS Interface

Mobile Telephone Interface

Vehicle CAN Simulation

Vehicle Configuration

Vehicle Diagnostics

Multiple Power Supplies

Fault Insertion

Scripting/Modeling

Logging

HUGHES Telematics engaged DGE to create the "Vehicle Drive Simulator" for integrating a telematics control unit (TCU) into a CAN-based vehicle. The VDS simulates a "connected" on-road environment to aid in the development effort of their TCU. The VDS is a rack PC system that allows engineers to create virtual driving scenarios that include vehicle CAN bus simulation, GPS satellite data, GSM cellular network, and simulated hardware I/O. The VDS links each of these elements together, maintaining tight control and synchronization over each in order to realistically model the moving vehicle.

The VDS loads a configuration file containing vehicle particulars such as bus speed, body style, and tire circumference. The user can initiate scenarios containing weather, RF signal reflections, geographic locations, and satellite paths to simulate all drive-related data.

The VDS connects the TCU to a complete vehicle CAN simulation which includes network signals such as ignition status, battery voltage, VIN, and vehicle configuration data along with actual background traffic for proper bus loading. The simulation also provides crash sensor data to prompt emergency/roadside assistance calls, door lock actuate messages and status feedback, and dead reckoning position data in the form of wheel sensor messages. Audio system CAN functionality is also replicated in order to test the interruption of audio for a phone call or writing information on the radio display.

Timing jitter, either random or based upon a pattern, may be injected for various time sensitive CAN messages to test robustness of the TCU's signal processing algorithms.

The VDS reports active/stored fault codes in the TCU and allows the user to access TCU diagnostic data. A fault insertion unit allows opens and shorts to BATT/GND for all TCU inputs and outputs. Satellite and cellular anomalies may also be inserted to assess the TCU's behaviors.

All functionality can be scripted and logged. The system is capable of running scripts remotely, which allows design and test teams in different locations to use the system.



Telematics Vehicle Drive Simulator - User Interface

The VDS has greatly reduced the time required to integrate a telematics control unit into the vehicle environment. With the VDS's ability to simulate road, weather, and electromagnetic conditions, TCU functionality can now be proven in the lab environment without exhaustive road testing on a fleet of OEM vehicles.

The VDS changes the platform for future telematics systems development with its flexible and expandable design; test engineers will no longer have to rely on empirical data obtained from OEM test vehicles. Additionally, the closed-loop system allows for the creation of controlled and repeatable test scenarios impossible to achieve with test vehicles. As a result, the VDS is unparalleled by any other testing system available in the telematics industry.