Test system development for a major automotive supplier

Background

The customer, a global Tier 1 Automotive Systems supplier identified the need for a robust and flexible device to simulate the CAN traffic on a vehicle so as to provide a fully realistic communications environment for the testing of their Electric Power Steering (EPS) units. This device would replace an existing device in widespread use throughout the company in test environments and systems laboratories, adding greater flexibility and support for future requirements.

The device, designated the ECSD (EPS CAN Simulation Device), was required in two variants, one to handle the CAN messages only and the other to incorporate power handling in order to also simulate the vehicle battery and the ignition signal.

Figure 1: Power variant ECSD

The information contained in each CAN message relevant to the EPS was to be completely under the control of the user, so that the transmission of each message type could be enabled or disabled and any parameter in a message could be varied for test purposes, using (a) a simple front panel human interface (b) a PC connected to the ECSD and running a Windows application provided for the purpose or (c) a test rig supplying analog and digital signals recognised by the ECSD as being "mapped" to specific variables in the messages.

Because the CAN message map is unique to each vehicle variant, and is entirely specified by the vehicle manufacturer, the ECSD is required to be easily configurable for a new vehicle variant. In the ECSD's predecessor, each new variant required the creation of a new software release, but the ECSD was required to be configurable by simply downloading a configuration file via the PC application.

Project details

Timestar successfully bid, on a fixed price basis, to design & develop the ECSD hardware and embedded firmware, the PC Windows™ application and also the Configuration Tool. This is a separate Windows™ application which allows the user to create and edit configuration files.

The development was mainly carried out at Timestar's Newcastle offices, involving frequent liaison with staff at the customer's UK Technical Centre, but final test and commissioning was carried out on site at the Technical Centre.

Timestar is now manufacturing the units for delivery to various customer sites globally, and has also recently carried out a major upgrade to all 3 components of the software (embedded, PC control application and Configuration Tool).

Success in service

ECSD units have so far been delivered to Brazil, China and several European destinations.

Figure 2: CAN-only variant ECSD

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