

# Test Systems for Truck Testing

## Overview

The customer is a leading global company developing and manufacturing trucks in all sizes. The goal is to develop profitable products to ensure a strong competitive offer for each truck size based on common vehicle architecture and shared technology.

The Electronic Control Units (ECU's) are parts of the common vehicle architecture which is getting more and more complex. The customer has identified a need for more efficient and flexible ways of testing where the ECU's need to be tested manually, semi-automatically or automatically.

A number of test systems based on a common test platform are therefore provided to support the customer's product development globally for all truck sizes, both existing and future models.

## The Challenge

- Simulate all physical interfaces of all used ECU's simultaneously.
- Support single ECU testing by simulating the truck network and all other ECU's.
- Easy reconfiguration of test setup in order to test all truck models for all brands.
- Support environmental simulation models in order to resemble a complete truck driving on the road.
- Design, Build, and Ship test systems to the customer globally with local support.



## System Description

- The platform is based on the test concept xMove. The concept provides a distributed I/O solution where each ECU has its own customized interface box with the data buses connected between the boxes.
- Each interface box is configured with a National Instruments CompactRIO system and computer controlled interface boards providing functionality such as signal conditioning and fault injection.
- The system is operated by a desktop PC connected to one or more powerful real-time PC's used for testing and simulation. These real-time PC's are controlling the distributed CompactRIO units.
- All software in the systems is developed using NI LabVIEW, the leading software for graphical system design. In the test platform LabVIEW is used for:
  - Control and supervision with NI TestStand executing the test sequences.
  - Real-time simulation supporting Simulink models using NI Simulation Interface Toolkit.
  - Low level FPGA programming of the CompactRIO I/O for high performance signal conditioning.