Automation & simulation techniques

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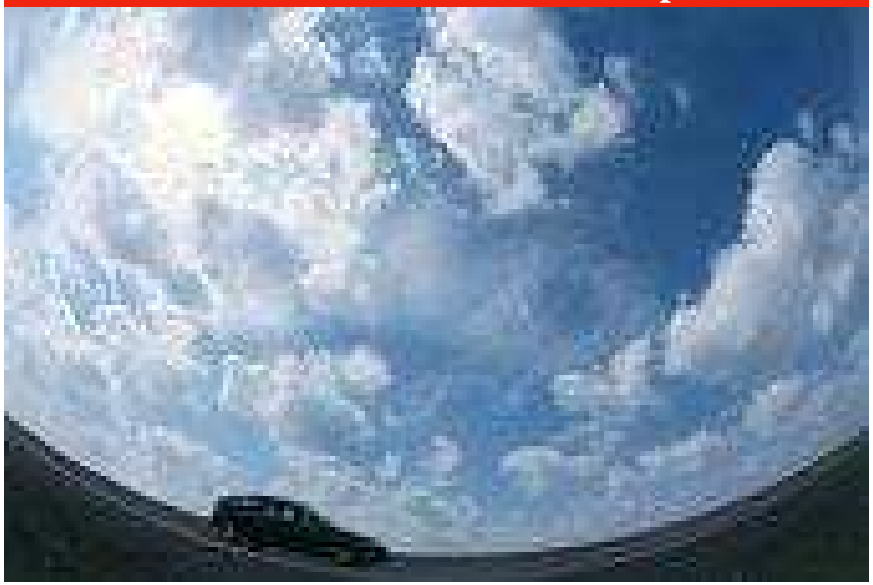
Company profile

company profile ’09

Our aim is to make the world a safer place



vision

Our vision is a more secure world everywhere and at all times

mission

Cobra's mission is to provide worldwide, user friendly vehicle-centric solutions integrating advanced technologies that enhance **transportation and property security** and to work with public and private organisations that share our vision

Cobra solutions

The antitheft

The manoeuvring aid

The Location Based Services

Partnership with Vehicle Manufacturers

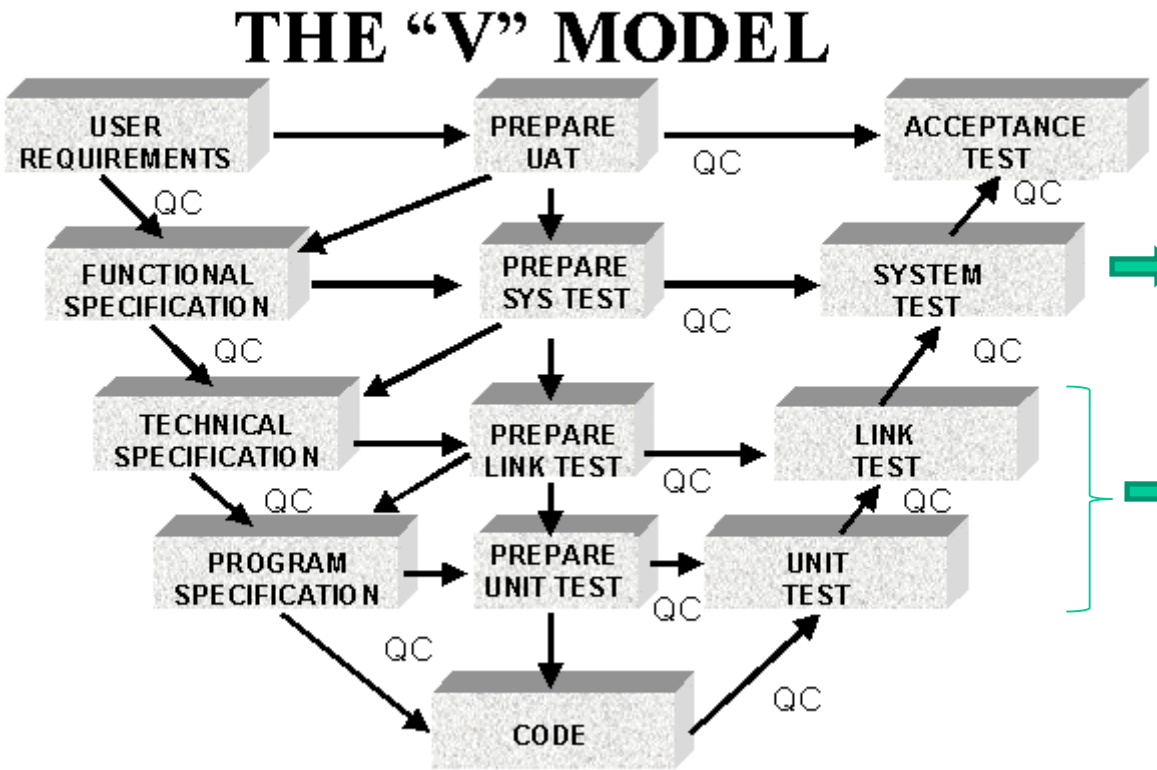
	since
Nissan	1991
Renault	1993
Volkswagen - Audi	1994
Honda Access Europe Motorcycle – Ducati Motor	1996
Toyota	1999
Renault Véhicules Industriels – Volvo Trucks – Porsche – Ford Daimler- Chrysler – Jaguar – Land Rover – Mazda – Skoda	2001
Honda – Ferrari – Maserati – Yamaha Motor Europe	2002
Mitsubishi – Bentley – Lamborghini	2003
Scania - MV Agusta Corse	2004
MV Agusta Motor	2006
Hyundai – Kia – Iran Khodro – Shanghai Volkswagen	2008
DPCA (Dongfeng Peugeot Citroen Automobile Company) SAIC (Shanghai Automotive Industry Corporation) BHMC (Beijing Hyundai Motor Company) – Geely	2009

Cobra aims at being recognised as a company constantly focused on understanding security needs. The goal is to give to client partners the solutions that contribute to reinforce their image of responsibility towards security.

Partnership with Vehicle Manufacturers

Software life cycle

Cobra applies the V model in software process development

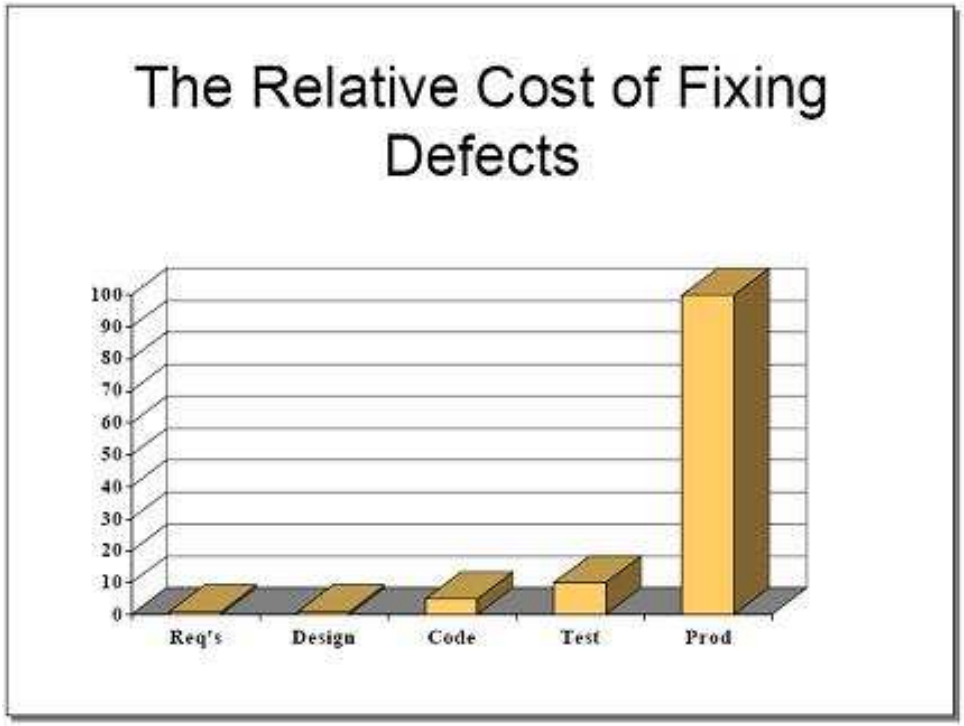


Functional test based on black box test

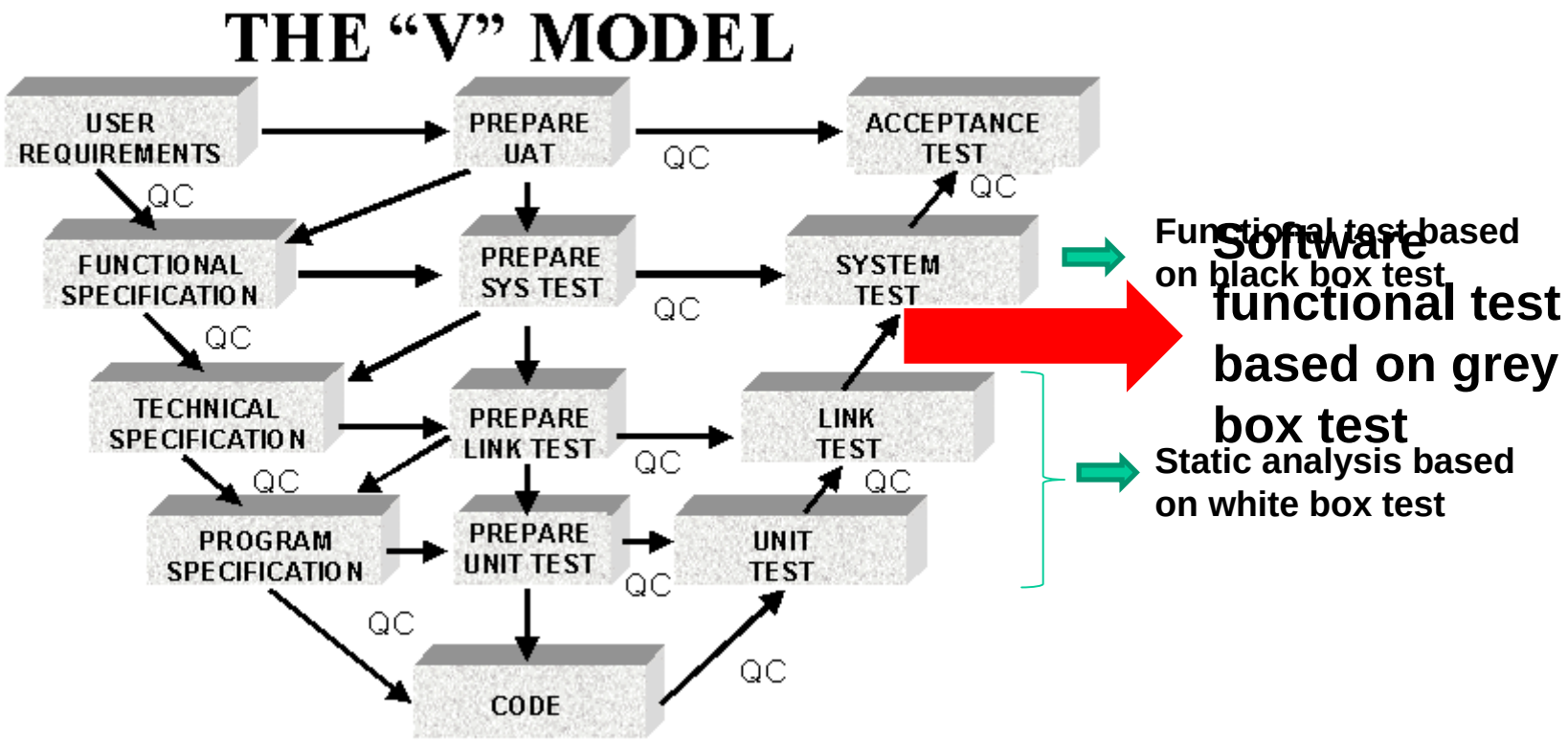
Static analysis based on white box test

Bugs cost

Bugs costs vs. project phase



COBRA's strategy



The aim is to test only the software functionalities on real target

The real system

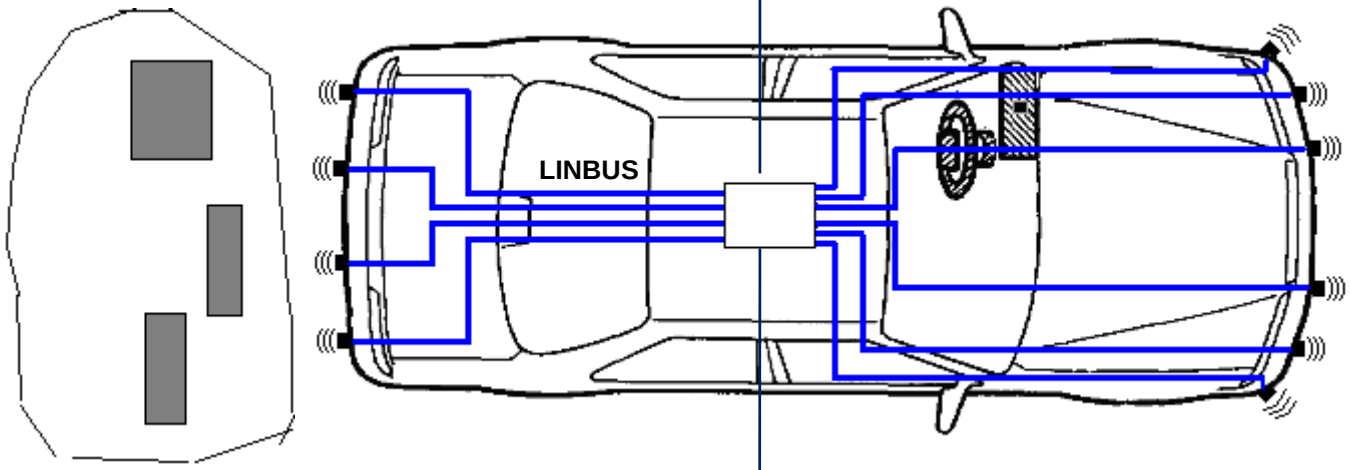
Dashboard

CANBUS

P.A. Display

Gear

Environment

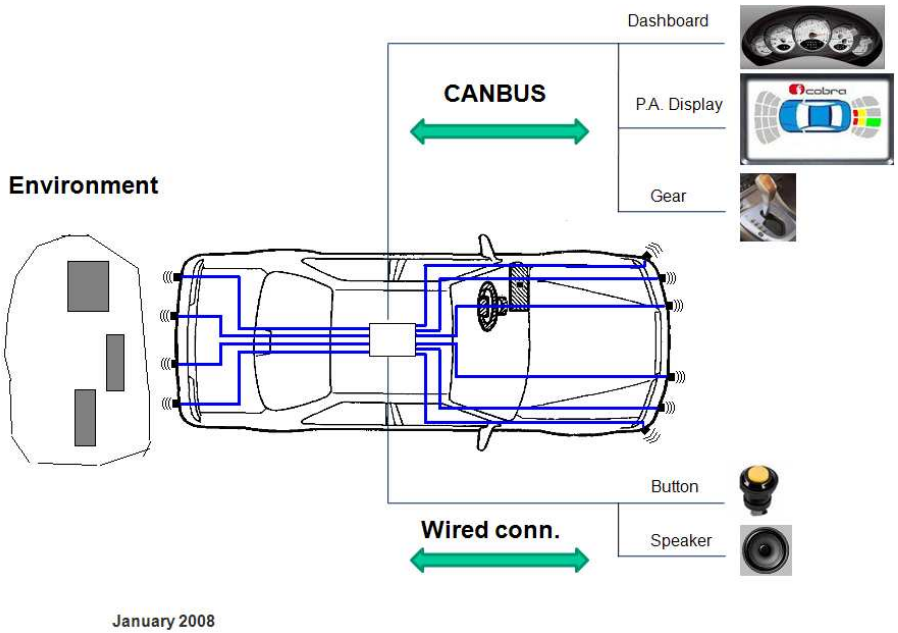


Button

Wired conn.

Speaker

The real system



Isolate SW testing in real environment could be problematic because of the interaction with:

-Bus line
-Sensors
-Environment
-Electrical noise

The challenge

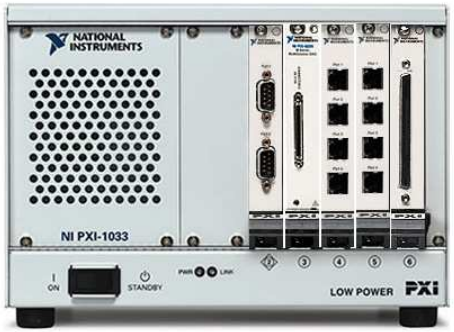
Provide simulation tools that allow SW Engineers to debug SW Functionalities

Use the same simulation tools to execute the test cases

Allow test engineetr to automate test cases execution

Reduce the cost impact of regression test

The virtual system



PCI Express

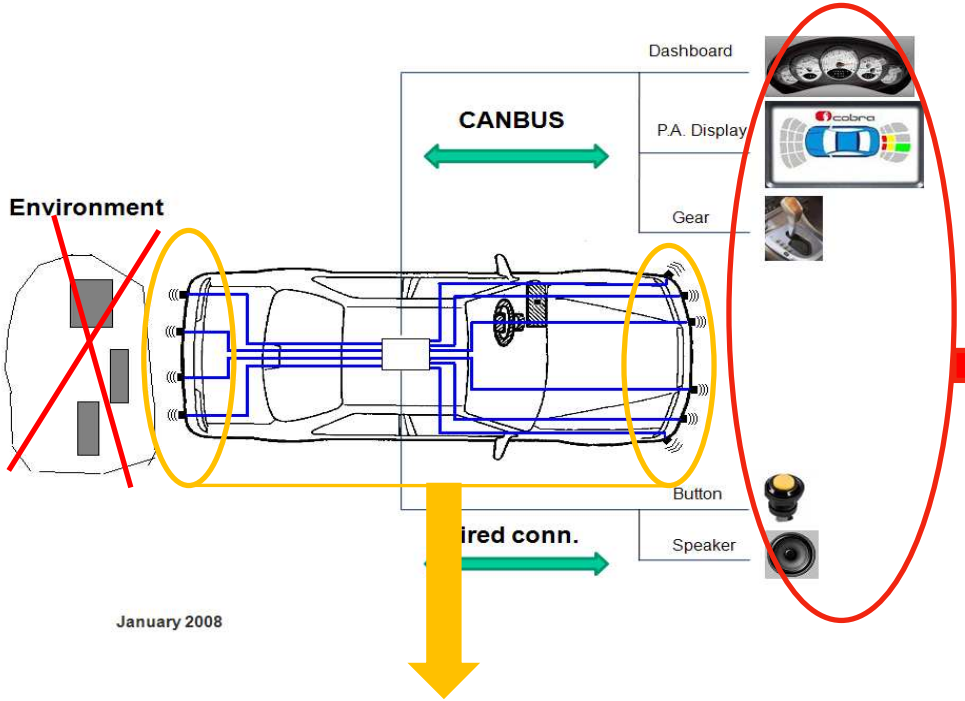
-PXI 4110 Power supply
-PXI 8464 CAN bus device
-PXI 7831R FPGA
-PXI 6251 Multifunction acquisition device
-

I/O

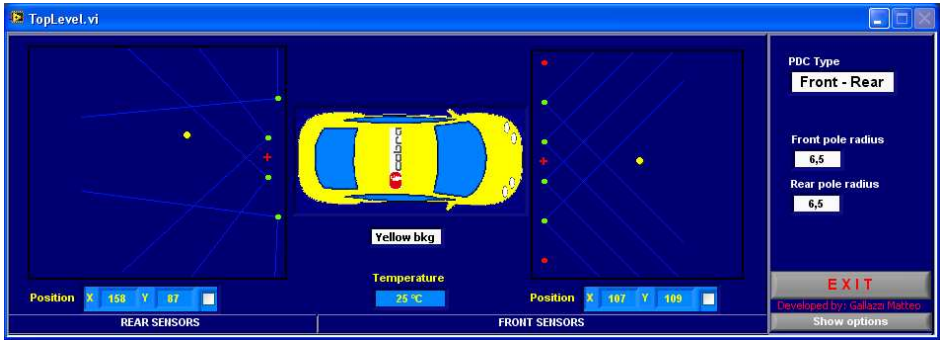
BDM

E.C.U.

The simulators



Windows



The monitors

This monitor is interfaced to:

- **CAN card**

  Shift gear simulation
  Vehicle speed simulation
  Display data monitor

- **Power supply**

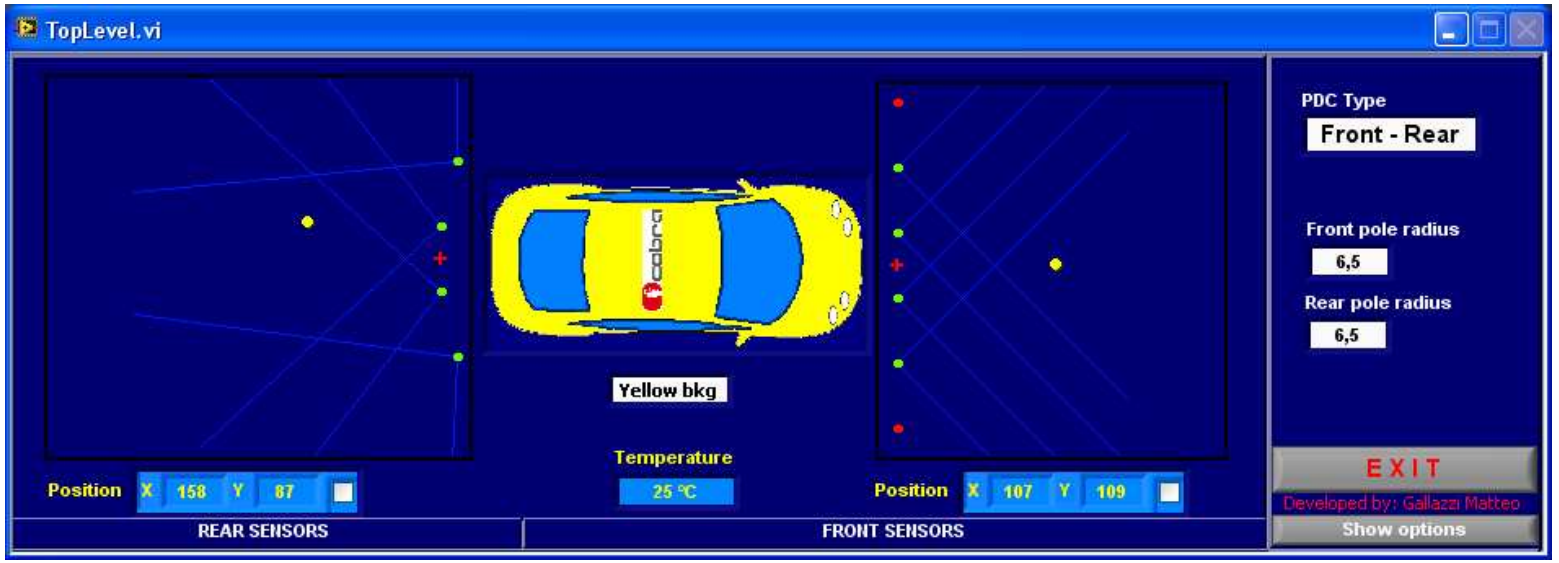
- **P&E BDM**

  Measured distance
  FW ver.
  Any RAM address

- **Data acquisition device**

  Speaker line monitor
  Switch button simulation
  Digital I/O monitor

The monitors



This monitor is interfaced to:

- **FPGA**

  Simulate obstacle
  Simulate sensors failure
  Simulate sensors EEPROM
  Simulate protocol issues beetwen sensors & E.C.U.

FPGA

Nonstandard LINBus protocol to reproduce

Flexibility

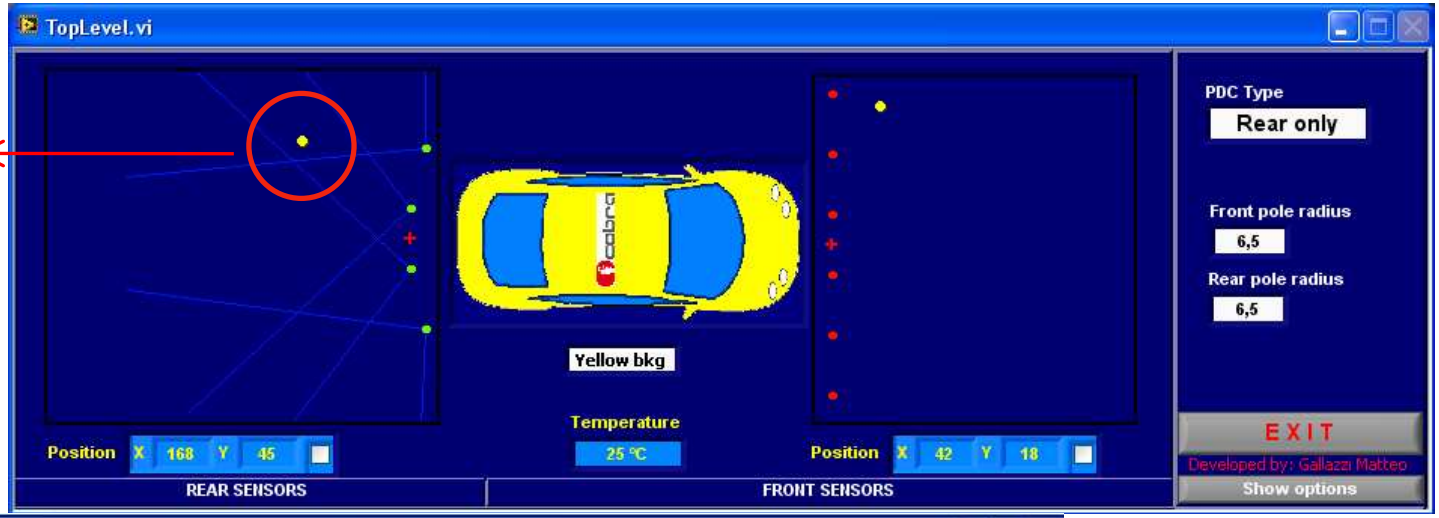
Cheaper than other commercial tools

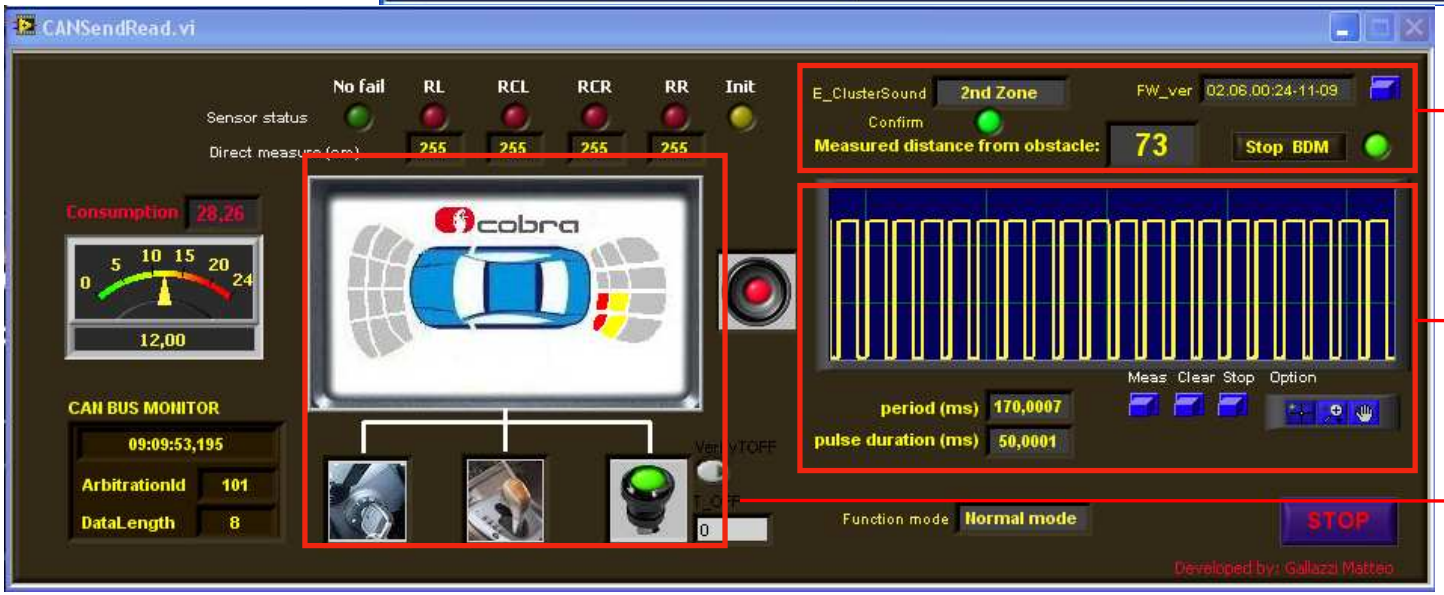
Very fast communication schedule

Hardware design not needed

Simulation

Obstacle simulation



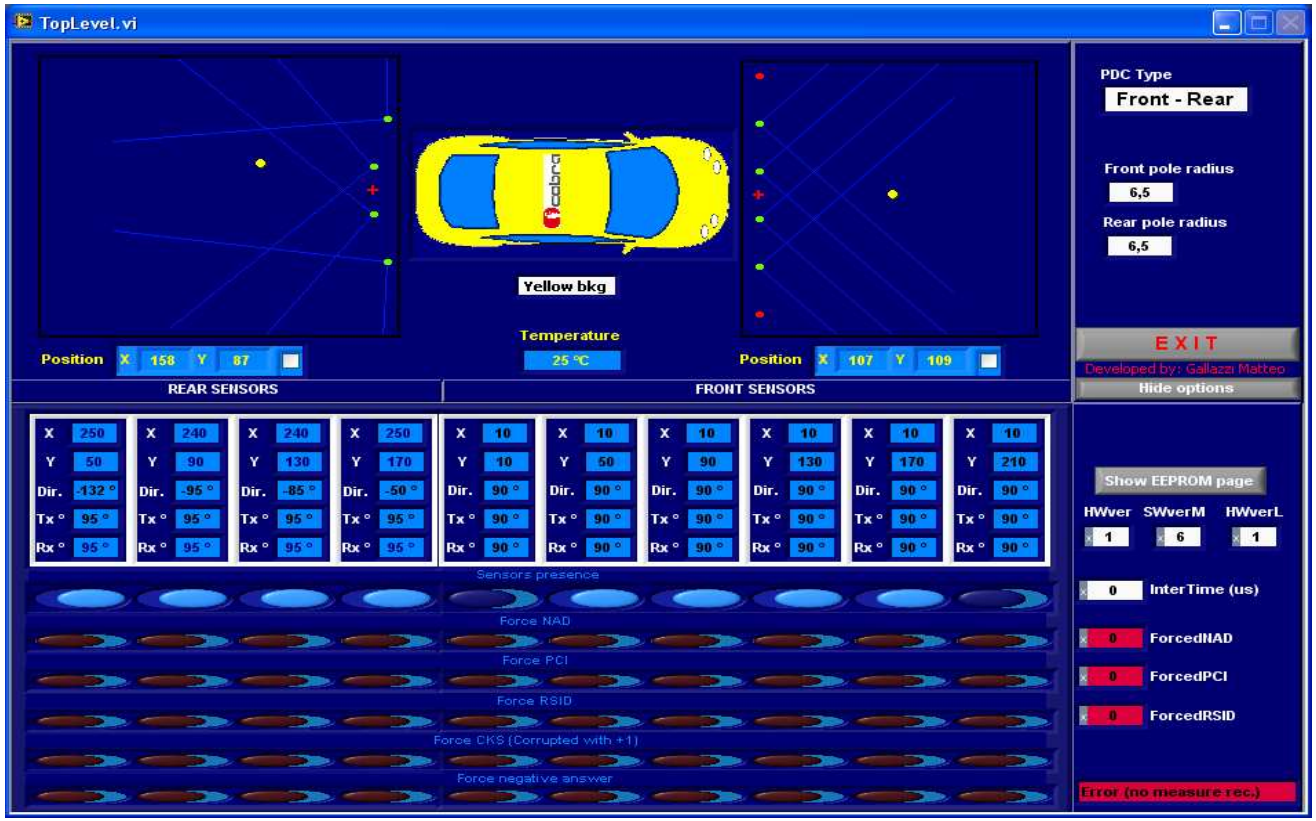


BDM Data

Speaker output monitor

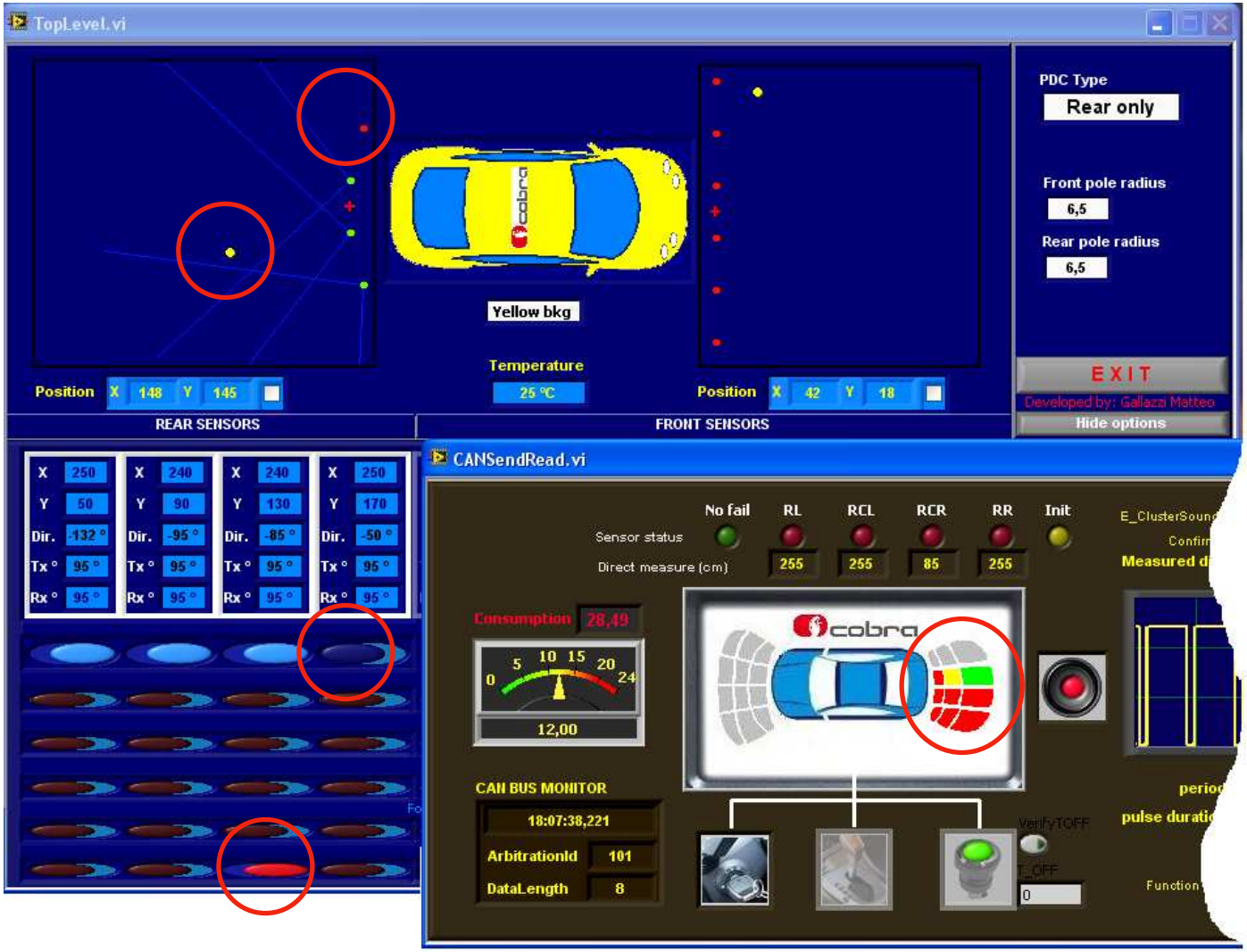
CAN information

Simulation



Possibility to simulate protocol issues

Simulation



Simulation benefits

Create simulation environment that can not be easily reproduced in real environment

Reduce development time and helps engineer s to verify their code

Software isolation to avoid environmental interference

Reuse of simulation tools for testing purposes

Software testing

In order to assure high quality to customer, COBRA wants to perform all the test cases after each software change (100% regression test)

Software tests are fully automated to reduce regression test costs

A better quality is assured avoiding human interaction

Anyone can run the automatic test sequence

Test Reports are automatically generated

The automation

Sequence automation realized through NI TestStand

By using the VI Servers techniques we can create new test case as well as an operator that set the control and watch the result on the monitor

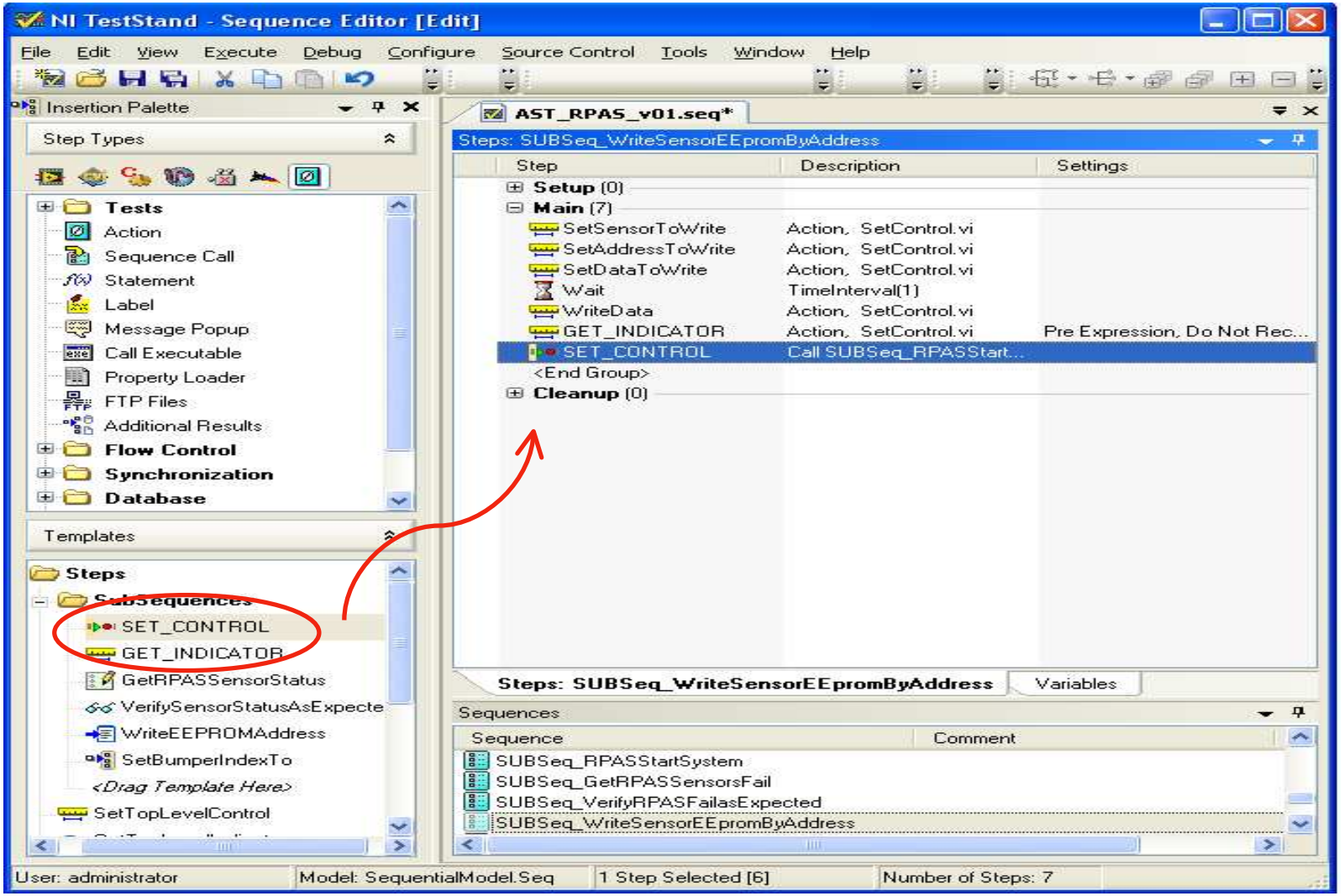
New test cases can be generated from a template using drag & drop functionality

The complete sequence is created using just 2 common step templates:

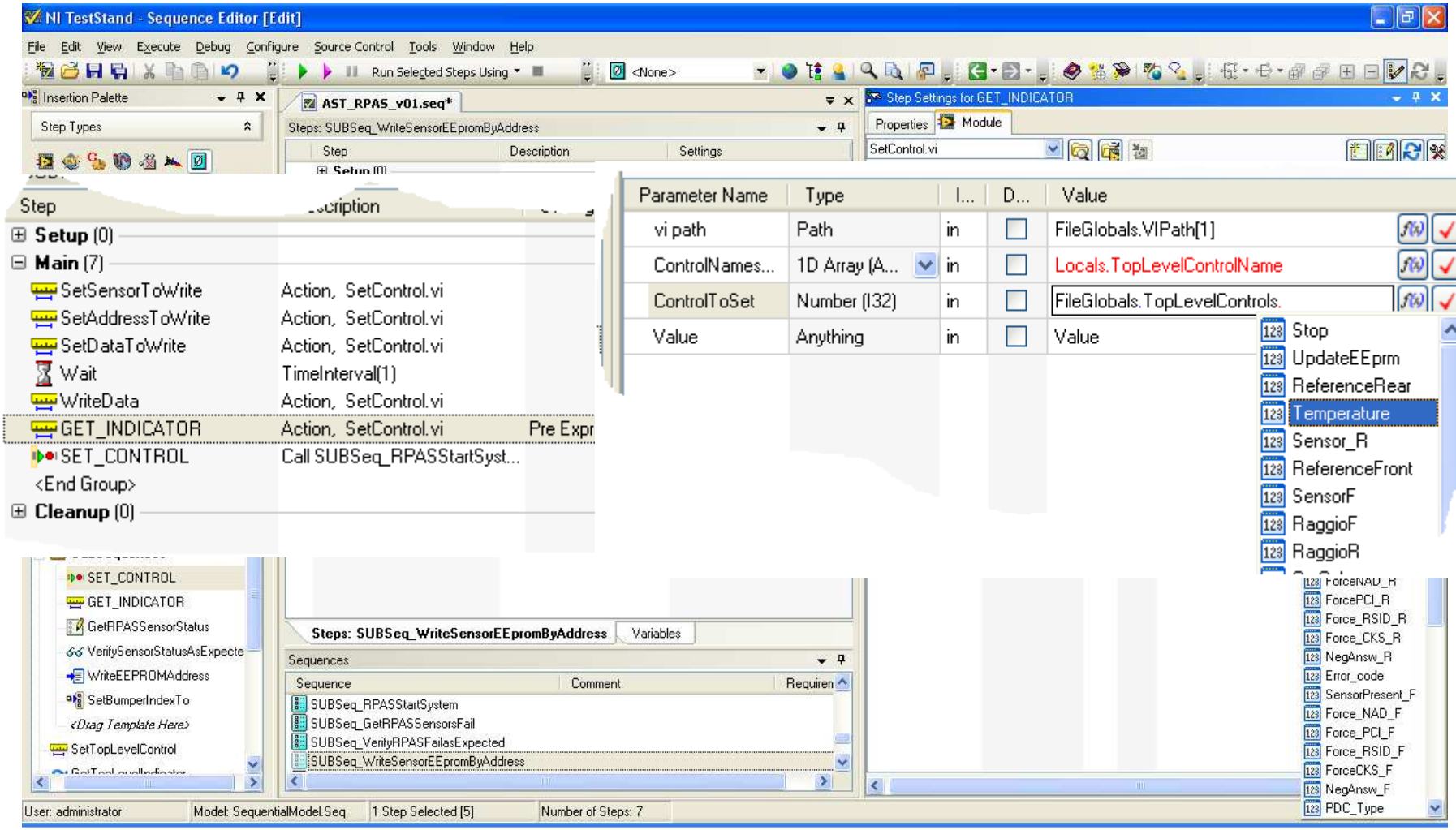
SET Control
Get Indicator

Software knowledgment not needed to automate the test case

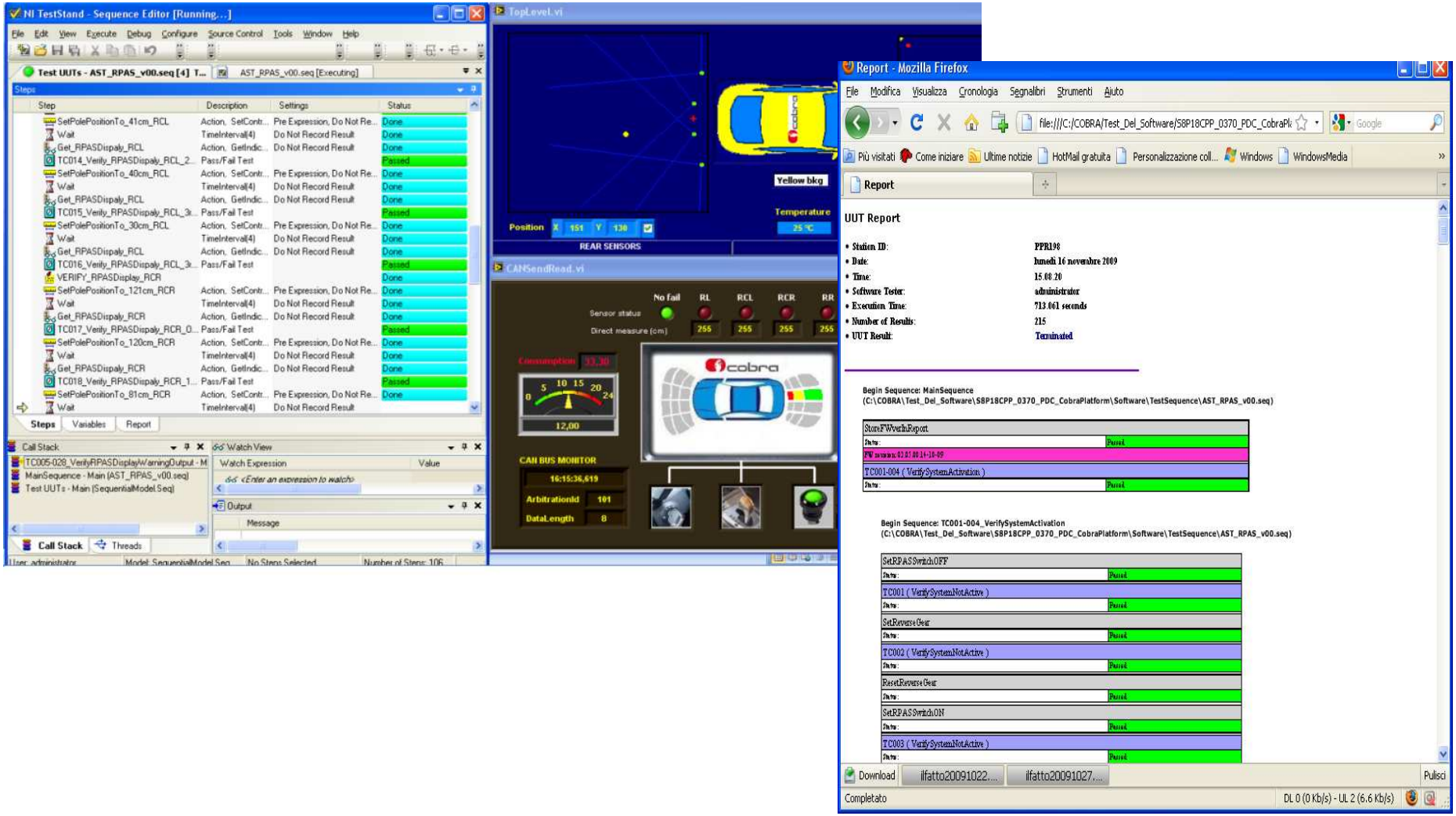
The automation



The automation



Final result



Conclusion

Full coverage of Functional Requirements

Test Cases execution fully automated

Software knowledgment not needed to add test cases

Reduction of Project costs thanks to grey box test

Reduction of Regression Test costs

Higher quality for our customers

TARGET HAS BEEN ACHIEVED