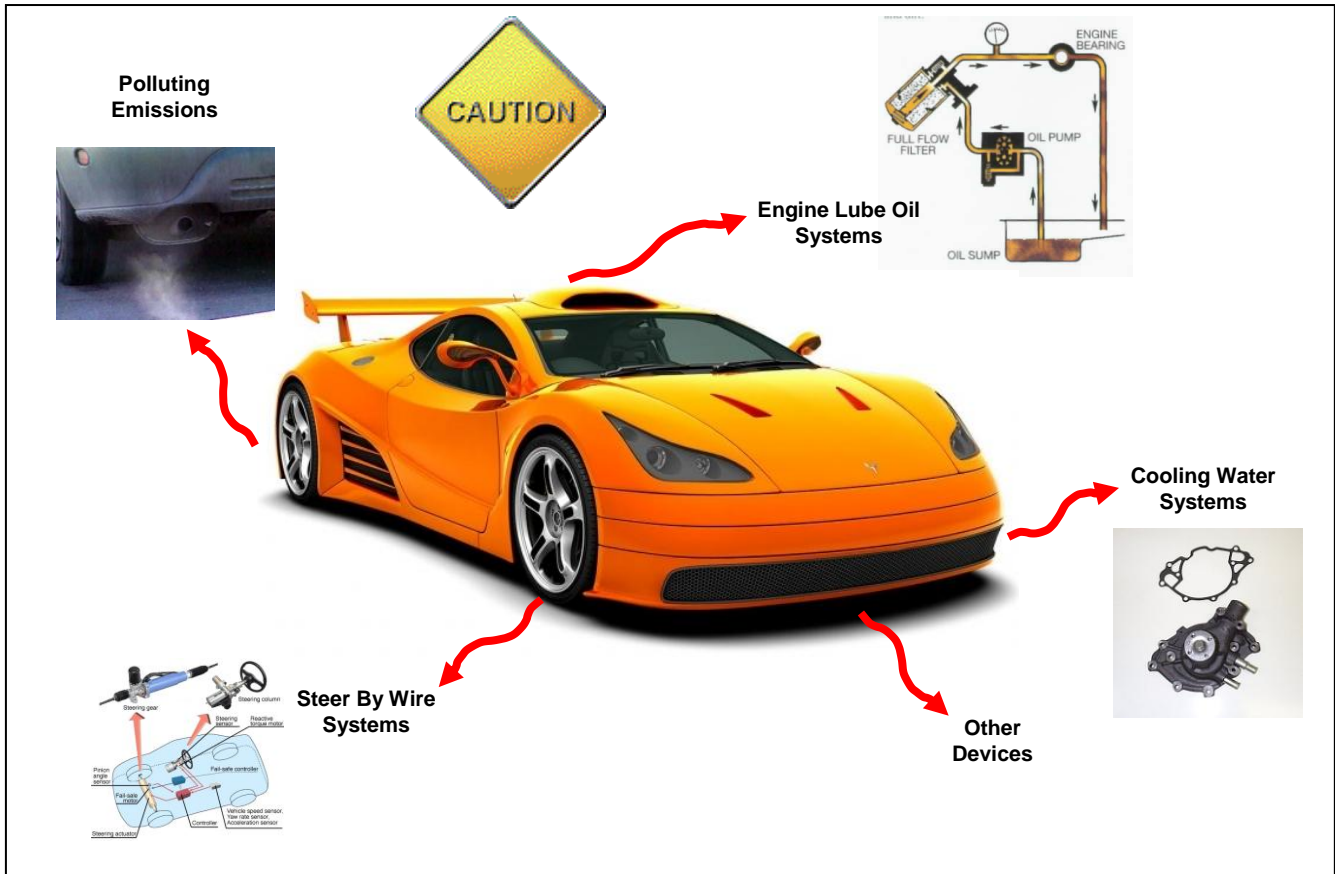


SDT-AUTOMOTIVE

TOOLS FOR AUTOMOTIVE ON & OFF-BOARD DIAGNOSTICS



OVERVIEW

SDT-Automotive™ is a suite of software tools which provide advanced diagnostic algorithms, specifically designed for the automotive field.

In particular **SDT-Automotive™** includes a wide set of diagnostic algorithms (based on several black box models, e.g. Neural Networks, State Space, etc.), which can identify incipient faults within typical automotive devices, such as:

- Steer by wire systems;
- Engine lube oil systems;
- Cooling water systems;
- Etc.

BACKGROUND

The knowledge required for the development of **SDT-Automotive™** has been gained during several projects carried out by S.A.T.E. within the last 6 years, in particular:

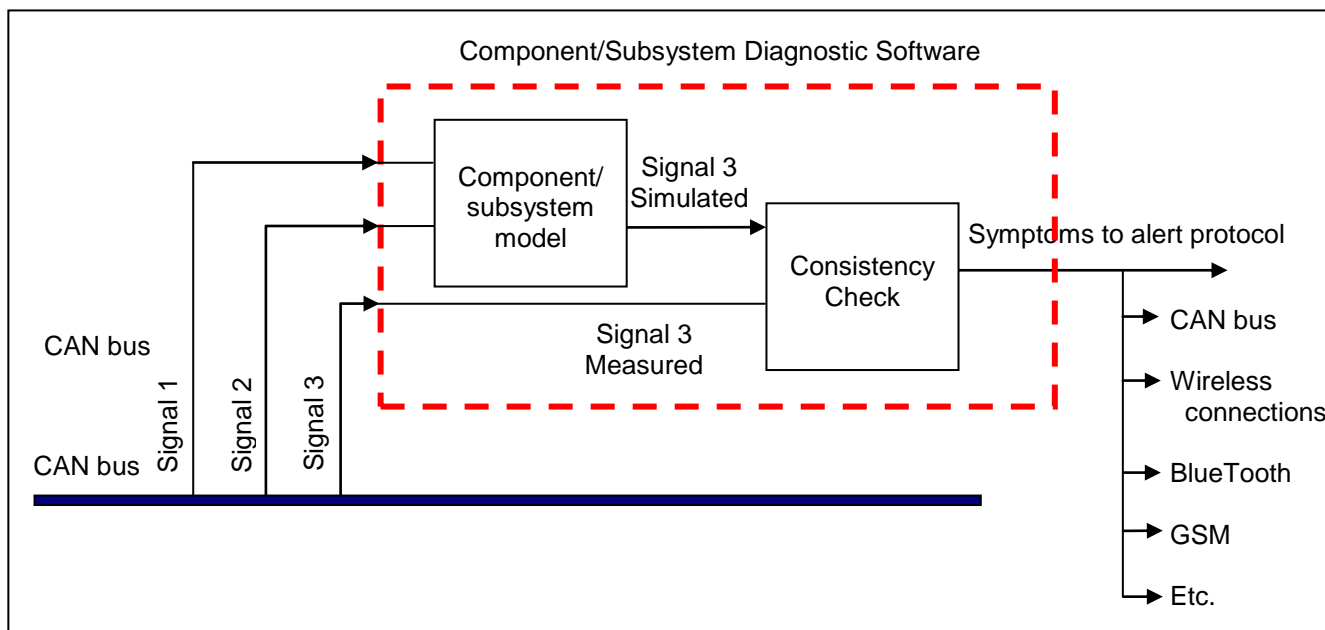
- **DIAMOND** (1998-2001): an R&D project partially funded by the European Commission, aimed at increasing the availability and safety

of industrial installations, through a new monitoring and diagnosis approach based on agents and a distributed intelligence architecture, on a common knowledge base;

- **ENDURANCE** (2000-2001): a feasibility study performed on behalf of a renowned car manufacturer, aimed at detecting incipient faults on prototype cars undergoing endurance tests;
- **MAGIC** (2002-2004): an R&D project partially funded by the EC, aimed at providing plant supervisors with clear and as detailed as necessary, information regarding the onset and cause of abnormal plant conditions and to suggest appropriate remedy actions or controller reconfiguration.

OPERATIONAL SCENARIO

The algorithms provided within **SDT-Automotive™** have been implemented and tested under the *The Mathworks'* MATLAB® environment: a very powerful, mathematical and simulation environment.

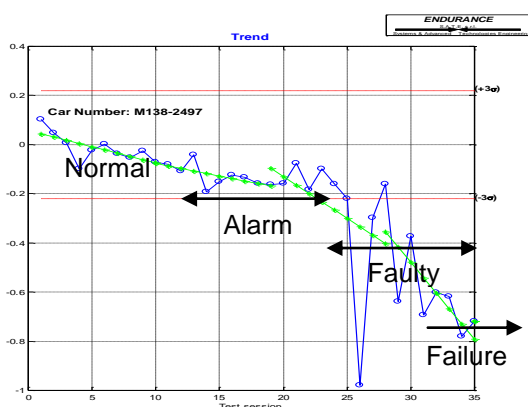


They can be used in two different ways:

1. **off-line** (most suited for prototype development) to perform advanced analysis of the cars' performances;
2. **on-line** (most suited for future on board diagnosis) using a set of dynamically linked libraries (*.dll), derived from MATLAB® functions, and used directly by the on-board Electronic Control Unit (ECU), the latter being completely independent from the MATLAB® environment.

In both cases a configuration of the algorithms parameters is necessary and can be provided by S.A.T.E. to the car / component manufacturer in two possible ways:

1. **as a service:** the most suitable model for the control of the desired characteristics is developed and identified, using a set of signals acquired during a "normal" working condition of the vehicle, and a set of configuration parameters provided. Each time a new configuration is necessary, the customer is requested to only provide a new set of signals on which the old model will be re-identified or a new model developed;
2. **as a software kit:** the entire model development and identification process can be performed within a proprietary software, which allows the customer, employing a user friendly GUI, to develop and identify several black box models, thus to obtain the configuration parameters required by the abovementioned dynamic linked libraries.



S.A.T.E. Systems and Advanced Technologies Engineering S.r.l.

Santa Croce 664/a, 30135 VENICE (ITALY)

Tel.: +39 041 – 2757634

fax: +39 041 – 2757633

Email: info@sate-italy.com

www.sate-italy.com