One environment for three different functions:

**CONFIGURATION**
Configuration and parametrization of machine cycles.

**CONTROL**
Control, supervision (numerical and graphical) through PLC communication (on Profibus network or Ethernet or Modbus protocol), local storage and, if required, on TAS (Test Area Server), of all measures and statuses collected during the cycle, such as bench sensors, engine sensors and ECU diagnostic.

**REPORTING**
Creation of reports for examining all data collected during the test and exporting them in specific formats (default Excel compatible).

Creation Environment: Labview 2014
NATIONAL INSTRUMENTS
Operating System: Windows 7 © or superior
HW Interface: PLC Siemens, National Instruments CompactRIO
Remote control: VNC
The configuration of engine cycles is freely and fully parametrizable by the customer and requires neither the recompilation of the source code, nor the intervention by specific software users.

The only real restriction for the configuration is a proper operator’s access level.

The system allows to define the overall access level. The configuration is a proper operator’s access level. The only real restriction for the intervention by specific software recompilation of the source code, nor the customer and requires neither the test cell. Such feature is only available in combination with TAS (Test Area Server).

For each alarm activated in the test cycle, it is possible to define the alarm thresholds of collected measures: setting of tolerance thresholds on the measures to be checked as an additional condition for achieving a successful step.

The test cycle is freely configurable, thus enabling the operator to define the targets which engine should achieve in order to be considered as “good”. The configurable steps for each alarm are the following:
- start / stop;
- speed setting;
- torque setting;
- throttle position;
- engine coolant temperature setting;
- wait;
- manual tests;
- idling engine;
- special check (e.g. ECU diagnostic);
- data recording start / stop;

Alarm thresholds of collected measures. Up to four tolerance thresholds for each measure collected by the system can be configured for each cycle step; two of such thresholds (high and low) will determine the reject of the engine under test, whereas the remaining two, if exceeded, will also determine the test cycle interruption.

Accessory functions. Some settings will also make possible a further customization of each cycle step, even if they are particularly needed during the set-up of the cycle itself. In particular, the following items can be set at one’s discretion:
- operator confirmation;
- time-out;
- wait for stabilization.

Manual override: in each moment, during a cycle or even before, it is possible to use a manual console to have a direct control of the engine under test through the dynamometer.

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- data recording start / stop;
- engine coolant temperature setting;
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Scalable: possibility of being adapted to the customer’s requirements, in particular for changes in the acquisition hardware and to support specific procedures.

Multi-language: Italian and English (predefined), possibility of extension to other languages.

Multi-user: possibility of identifying the user.

Multi-level accessibility: the access to the functions of the system can be restricted on the basis of the authorization level of the operator (quality, configuration and management of the predefined levels).

Multi-page: the desktop can be fully customized using the several indicator types already available.

Integrated diagnostic tools: it is possible to handle a communication channel (CAN, UDS over CAN, KeyWord Protocol 2000 over CAN currently supported) with the ECM, for diagnostic purposes, or it is possible to communicate with a third-party diagnostic tools over an ASAP communication protocol.

Reports: generation of reports in .html and .xml format, fully customizable.

Export of data concerning the performed cycles in the graphical and Excel compatible (ASCII) formats.

Autonomous management of the operators’ lists with relevant enabling levels and faults detected by the operator.

Centralized: ability to automatically align the different benches (cycles) and to send data to the server within a test cell. Such feature is only available in combination with TAS (Test Area Server).

Usable: operator interface, easily and intuitively understandable for both management and configuration.

Modular: several additional modules can be added to the base system in an effort to support customer requirements and maintain a convenient cost/performance ratio.

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