

# CSS

## ENGINE TESTING CONTROL SYSTEM

One environment for three different functions:

### CONFIGURATION

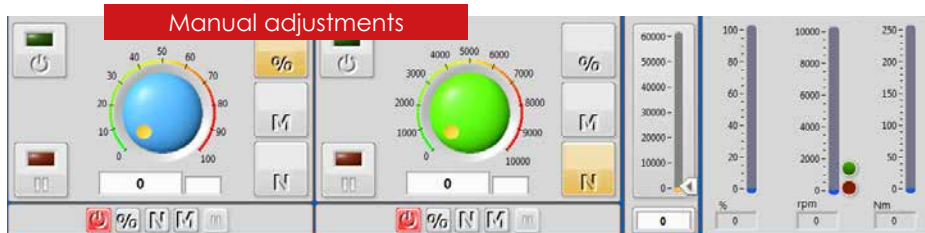
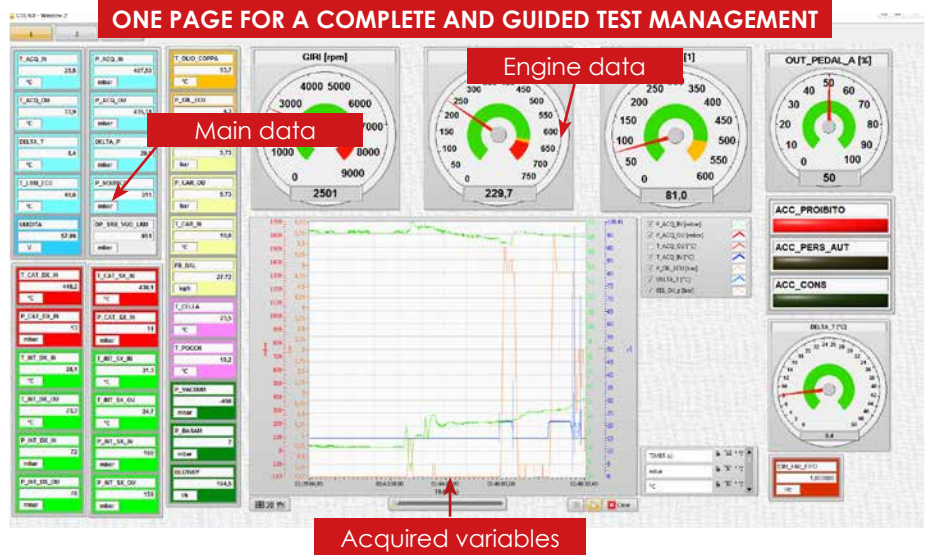
Configuration and parametrization of machine cycles.

### 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 limits** supported by the test bench, to avoid any potentially dangerous working condition.

For each **alarm** activated in the system, it is possible to decide the most appropriate reaction to handle the received notification.

For each **engine** version it is possible to define the **operative configuration** of the test bench (i.e. the fuel to be used and its pressure, the ECU to be used) and the **limits** that cannot be exceeded during the test cycle.

The **test cycle** (depending on the engine version) is based on a **sequence of steps**, each of them created from several **templates** already available. Each step type has its **own configuration mask** and generates a detailed **report** during its execution.

- **step type and description**: definition

of the target to be achieved; guided choice of the possible available options for configuring the cycle to be processed;

- **alarm thresholds of the collected measures**: setting of tolerance thresholds on the measures to be checked as an additional condition for achieving a successful step;
- **accessory functions**: additional step configurations can be customized according to specific requirements.

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 cycle 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;

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- end of sequence.

**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



**Scalable:** possibility of being adapted to the customer's requirements, in particular for changes in the acquisition hardware and to support specific procedures.

**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.

**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).

**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.