

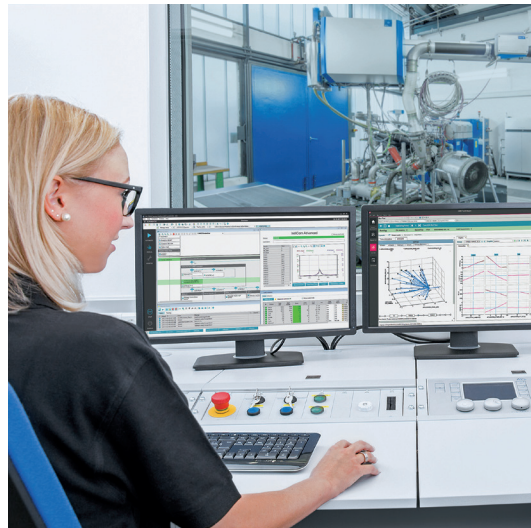
Simplifying powertrain testing

How to streamline the engine calibration process and make test configurations and data reusable

The trend toward electrification of the powertrain and the introduction of real driving emission testing have posed immense challenges for engineers in the field of powertrain control calibration when using a testbed. All systems and their associated controllers must be connected in the laboratory environment, and engineers must be able to easily configure tests to investigate specific phenomena and run Real Driving Emissions tests.

A typical automotive testbed, be it an engine-only or complete powertrain setup, is a highly complex beast. A test setup will typically include numerous devices to measure emissions, engine performance and electrical power for a variety of powertrain configurations and types – from combustion engines through to hybrids units to pure-electrical propulsion systems.

This is where things get complicated, because the testbed needs to be able to gain access to specialist devices and controllers for each powertrain component. For example, a diesel or gasoline engine complete with associated emissions systems will have one or more control units, all connected to specialist measurement devices from different suppliers. The electrical propulsion unit will have its own controller and specialist measurement devices. The data from each system is



AVL's innovative MultiSync Technology (ABOVE) comprises a combination of subsystems, such as the AVL IndiCom 2 indicating system, the AVL Cameo 4 calibration tool and the AVL PUMA Open 2 automation platform (RIGHT)

usually stored on separate file servers. Connecting all these devices and systems together, and in particular linking all the separate data files into a single entity, requires specialist knowledge, and here lies the crux of the problem: there is usually a limited number of experts available with specific knowledge of each system.

When defining a test task, the engineer is typically dependent on the availability and expert knowledge of the person responsible for each of the systems within the test specimen. Any local and

spontaneous modifications to parameters can only be made to a limited extent, and transferring a task from one testbed to another can only be done with the help of the system specialist.

Over the course of a project conducted by AVL for a leading OEM, seamless integration of systems was identified as a key success factor. The solution developed jointly by AVL and its OEM partner is called MultiSync Technology. The core of this state-of-the-art solution consists of the perfect combination of subsystems, such as the application system, indicating or e-power analysis system, calibration system and the automation system acting as the integration platform. Data from multiple devices is recorded as results and immediately synchronized. One engineer can now accomplish tasks

that previously required several experts.

AVL MultiSync Technology drastically reduces complexity in the system topology. The technology encapsulates changes made on one system and propagates the changes throughout the complete test system landscape. Powerful and intelligent interfaces enable configuration of the system independently of each task. Just one engineer is now able to set up and operate the complete system, eliminating the need for specialists in each area.

In addition to the technical improvements such as central data collection and storage, better usability and improved performance, MultiSync Technology offers harmonious interplay of all the systems involved. Thanks to this technology, development cycle times are minimized and test output is maximized. ◀

