



Expo news

Despite today's less than buoyant economic climate, Automotive Testing Expo Europe 2009 flourished. There was no doubt about it: green shoots of recovery were evident, with new development technology being launched for a reawakening automotive market.

OEMs will benefit from the wide range of simulation software that was launched around the show to help minimise the use of costly physical prototypes and road and track testing; and when the design is ready for hands-on testing, there is also an impressive range of new machinery to help them create cost-effective and time-efficient physical test programs. It was plain to see that test system suppliers have listened to the needs of OEMs to create good-value, high-quality cars in time to meet the needs of eager, reinvigorated consumers. This is the technology that will power the next generation of vehicles.

Still the place to be

As Daniel Riedelbauch from National Instruments stated, "You have to be there to reach out to customers who still have money and are looking for innovation. If companies want to sell again, they need to do something special, and create something new that other companies don't have. As a supplier for the whole automotive development process, we see that production is down, but R&D is still working."

This view was echoed by testing giant MTS, when its product manager Scott Bieganeck said, "We believe that we need to invest for our future, so we are continuing to enhance our products and our product lines. Although it's difficult in these economic times, we would like to come out ahead when the economy turns around."

As Gerald Sammer, global product manager at AVL said, "It is absolutely worth being here."

Measurement technology launches

Ipetronik launched four new technologies at the Expo. The first was SAM-HVISO DC 1000, which offers a voltage divider with full electrical isolation that enables reliable voltage measurement for accumulators and DC power circuits in electric and hybrid vehicles. The solution consists of two components that can be used as ballast modules for measurements on high-voltage systems. The first component, the ISO Voltage Divider, is an electrically isolating buffer amplifier. The second part is an intrinsically safe measurement cable with current-limiting resistors at the terminal points.

The second technology on show was Mx-SENS 8, the first in a series of fast measurement modules for highly dynamic measurement. This compact module is

based on a new hybrid bus system and, through a clever combination of standard solutions, it unites the positive characteristics of CAN, Ethernet, IEEE1588 and XCP protocol, and provides approximately 50 times the bandwidth of the CANbus.

Andreas Geh, director of sales and marketing at Ipetronik, stated, "This compact module is based on a trail-blazing hybrid bus system that cleverly combines standard solutions to unite the positive characteristics of CAN and Ethernet. It is as simple and robust as CAN, and as fast and as widespread as Ethernet."

Next up was the McTHERMO K8, an ultra-compact module with eight electrically isolated analogue measurement inputs for connection to Type K (NiCr/NiAl) thermal elements, and for

measurement of voltages up to $\pm 30V$. Finally, FLEETlog and FLEETlog WAN are two intelligent dataloggers for continuous mobile operation in road trials and in fleet management. Each of the dataloggers has four electrically isolated CANbus inputs as defined in ISO 11898-2 for acquisition of vehicle data and/or sensor signals via CAN measurement modules. The loggers acquire the data, process it online, and store it on an exchangeable CompactFlash card for further processing. Geh added, "We have invested years of development experience in these two loggers to make mobile measurement-data acquisition even more efficient. With FLEETlog, users can further optimise the costs of their fleet projects."



Durability recorder for tough mobile data acquisition

LMS introduced its new mobile durability data acquisition system, the SCADAS Durability Recorder. The device is designed for rugged data acquisition in extreme conditions, making it resistant to water, dust, dirt, shock, vibrations and jolts associated with real-life testing. It offers strain-based vibration and displacement

measurements in a single system, eliminating capital investments in multiple systems.

The robust design can stand up to extreme climate, shock and vibration conditions, while the MIL-STD-810F certified LEMO connectors ensure vibration-resistant cable connections. The system is available in a sealed

version to resist dust and water according to ingress protection code IP54.

The recorder can be equipped with a range of universal modules. Users can expand their system from mobile data acquisition for durability to human body vibration testing, sound power homologation, structural and modal analysis and rotating

machinery testing – all on one system.

"Durability data acquisition is an expensive and time-consuming process, with stressful deadlines and difficult working conditions. The SCADAS Durability Recorder offers the perfect fit for these tests, combining a compact design with full measurement power and flexibility,"

commented Bruno Massa, vice president of the LMS Test Division. "The new SCADAS system adds on to the LMS portfolio of products and services covering the entire durability process – from realistic design and validation with accurate loads to accelerated durability testing and simulation techniques."



Datalogger released

The high-speed PikesPEAK datalogger was launched by AFT Atlas Fahrzeugtechnik GmbH at the Expo, for data acquisition in high dynamic systems. It records transient signals with a sampling rate of 500kHz in addition to a counting accuracy of 100ps. The modular design enables the user to adjust and extend the system individually. The decentral Ethernet-linked modules are specially designed for test-bench and real-world in-vehicle use.

Version 2.2 of the 4Log datalogger was also presented at the show. It simplifies the configuration of the datalogger by updating A2L address files and DBC files for describing connected networks at the touch of a button. Another new feature of 4Log and the decentral 4Measure modules is the simultaneous recording of measurement signals via CAN pulsing.



Dummy positioning system

To meet the new Euro NCAP evaluation processes relating to automotive seats, AICON, together with a manufacturer of car seats, has made ready the dummy positioning system, DPS.

With DPS, the user can put the dummy in the correct position (h-point, head, knee, head angle) and also assign 3D points on the dummy and the sled (according to the directives) with a hand-held probe.

Consequently, DPS enables measurement of all symmetries and additional points on the seat (setup wheel, headrest and armrest). Furthermore, the measurements showing the distance between head and headrest and the determination of the offset are completed within a very short period of time. Eventually, DPS determines and measures the point where the head impinges the headrest.



GPS Simulation Toolkit 1.5

National Instruments announced the NI GPS Simulation Toolkit 1.5 for LabVIEW, an extension of the graphical system design environment that expands the NI RF PXI platform to provide engineers with a cost-efficient, high-performance solution for GPS receiver testing. The latest version of the GPS Simulation Toolkit gives engineers new satellite simulation features including extended duration of non-repeating GPS satellite signals and the ability to customise motion profiles for mobile receiver tests.

The Toolkit 1.5 offers an easy-to-use graphical API

for validating and testing GPS receivers. Engineers can simulate C/A codes for up to 12 satellites in the L1 band. The toolkit also features waveform creation tools to specify both the receiver location and velocity, and the ability to create waveforms with up to 24 hours of non-repeating GPS satellite signals, giving engineers a longer period of non-repeating simulation data than other GPS test solutions. This makes it possible for engineers to achieve extended reliability testing and superior control over signal impairments introduced during design verification testing.

The latest version of the toolkit also adds new capabilities for custom motion trajectories, so engineers can simulate the signals that GPS receivers capture on specific routes. The ability to simulate these signals using software-defined instrumentation helps engineers conduct customised and repeatable tests featuring route-specific signals without performing drive tests. Additionally, with the GPS Simulation Toolkit, engineers can adjust individual satellite signal powers during signal generation for dynamic range and scenario-specific tests.



Optical derotator for vibration mapping

Rotating objects such as fans, turbines and tyres can now be characterised under real operational conditions up to 24,000rpm, following the launch of Polytec's Optical Derotator.

Sophisticated control electronics track the motion of the rotating object, resulting in a steady position of the laser beam on the rotating object. The deflections, shapes and resonant frequencies due to stiffening effects at high rpm levels are measured. Use of the Optical Derotator makes order analysis and vibration measurements feasible – and simple. Because the speeds are synchronised, the object

appears to be at a standstill to the operator. A laser vibrometer scan now becomes as simple as Polytec customers were used to.

Polytec supplies a complete solution

comprising the rotating unit with encoder input and an adjustable base frame for angular and high correction, a PSV-400 scanning vibrometer and a reference laser.

The Optical Derotator delivers high-quality input data for the FEM validation and is an indispensable troubleshooting tool for durability issues and acoustic challenges.



Altitude simulation chambers for cost-effective testing

Today, more than ever, the reduction of costs through time-optimised processes during the development of a vehicle is a decisive factor in its success. This is just as relevant to testing the effects of different climatic conditions, such as air pressure, that prevail in different regions of the world.

Weiss Umwelttechnik GmbH proudly showed its altitude test chambers at the Expo. Designed to enable the simulation of air pressure to a height of 4,000m, and with an additional combination of cold and climate, the chambers can be used for almost all imaginable tests of place and season, which can be performed independently and reproducibly.

The company discussed a recent big deal, by which it built a complex altitude simulation chamber in Hall 68 of the Volkswagen AG test centre in Wolfsburg, Germany. In this chamber nearly all types of worldwide climatic and environmental conditions can be simulated, helping to eliminate costly prototype



testing in different parts of the world.

All climatic environmental conditions to which a vehicle can be exposed are simulated simultaneously in the chamber by the following parameters: temperature, air humidity, pressure or geodesic height, sunlight, and airflow.

Furthermore, the chamber is equipped with an all-wheel roller testbed and a sunlight simulation system. This design enables ascent and descent driving in sunshine with radiation levels up to 1,100W/m² between sea level and 3,000m at velocities up to 112mph (180km/h).

Dyno demonstrations



Beyond the back doors of the Expo each day, there was a burst of excitement on the hour, every hour, as a Porsche Cayman wailed during demonstrations of VPA-RX, the latest Rototest chassis dynamometer.

Comprising an engine dynamometer fitted to each drive wheel, it is claimed to revolutionise the way complete vehicle testing is performed by transforming the traditional chassis dynamometer (using rollers) from a simple load absorber into a fully fledged true measurement instrument. This is done by using a front-end-mounted torque-measuring load cell and direct coupling. As a much valued instrument for auto manufacturers' R&D departments around the world for more than a decade, the Rototest VPA-RX chassis dynamometer has now been made available not only to R&D departments but also to aftermarket performance specialists and professional racing teams.



Mobile combustion analysis technology launched



The KiBox To Go Type 2893A, launched at the Expo by Kistler, allows very accurate determination of the key combustion analysis parameters in real time under actual operating conditions.

With the aid of CrankSmart technology, the crank angle signals of the vehicle's sensor can additionally be used for accurate engine combustion analysis. This capability avoids

the previously necessary optical crank angle encoder and strikingly reduces installation and maintenance work.

An easily understood user interface, use of PiezoSmart sensor identification, and automatic plausibility checks guarantee prompt measurement availability and high-quality data.

Integration into the INCA application system ensures combustion

analysis parameters can be recorded and analyzed synchronously with the ECU nominal data.

The KiBox To Go provides a mobile combustion analysis tool that ensures an extremely efficient approach to both engine applications and troubleshooting.

The new KiBox To Go has been given the red dot award: product design 2009.