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# AUTOMOTIVE TESTING EXPO NORTH AMERICA 2024

Find the exhibitors, presentations, demonstrations and workshops you need to reduce development time, cut costs and eliminate recalls – all under one roof

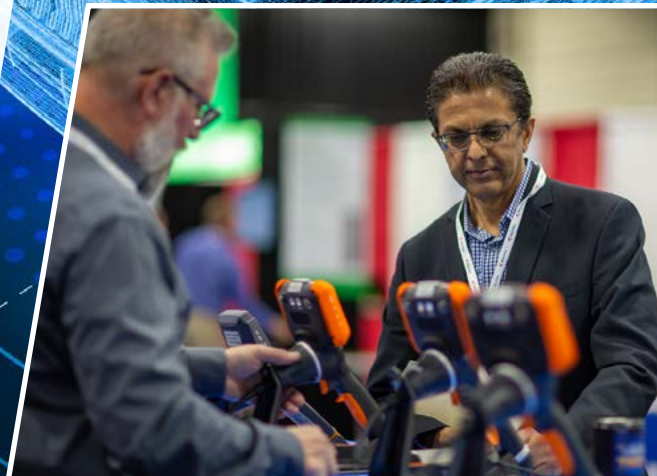
**J**oin us at the Suburban Collection Showplace in Novi, Michigan, this autumn to discover how to shorten product development lifecycles and accelerate the development of next-generation technologies while enhancing the quality, reliability and safety of vehicles and their components, thereby eliminating or substantially reducing recalls.

On display at the free-to-attend exhibition (October 22, 23 and 24) will be the full EV testing ecosystem, next-gen powertrain test and evaluation systems, technologies for ADAS development and validation, end-of-line testing, data analysis, software development and much more from 250+ leading international suppliers. New for 2024, the free

Innovation Showcase will host numerous special short sessions on the expo floor, highlighting innovative concepts, prototypes and future trends.

Meanwhile, The Future of Automotive Testing Conference will provide a brand-new platform for industry leaders to discuss what lies ahead for automotive testing and emerging trends through in-depth technical workshops, keynote presentations and panel discussions (the conference is free for OEMs and Tier 1s, and early-bird rates apply for solutions providers).

Find everything you need to implement cutting-edge time- and cost-saving solutions into your test, development and validation programs, enabling you to create performance-enhancing products. See just some of the highlights over the next 12 pages! ◀



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Innovation Showcase

**60+**  
SPEAKERS



# Driven by **security**

dSPACE offers a suite of cybersecurity test tools designed to identify weaknesses and vulnerabilities

WORDS BY MATTHIAS PUKROP AND LITAL CARTER

**A**s modern vehicles become more connected, autonomous and generally more software-defined, the automotive industry faces new cybersecurity challenges. Although new features in the areas of advanced infotainment services, V2X applications and ADAS and autonomous drive functions greatly enhance the overall driving experience, they inevitably increase the attack surfaces for cyberattacks and pose a real security risk.

At the recent Center for Automotive Research's Management Briefing Seminars (MBS) in Traverse City, Michigan, Harry Krejsa, the White House's assistant national cyber director for strategy and research, emphasized the importance of cybersecurity in the digitalization of the auto industry. He explained that the Biden administration's efforts to regulate and collaborate with the auto industry and others are motivated by concerns over cybersecurity threats and the potential benefits that technological advances like software-defined vehicles can offer to enhance citizens' lives and mobility.



New automotive cybersecurity regulatory frameworks and standards, such as UNECE WP.29 R155 and ISO/SAE 21434, require cybersecurity to be addressed throughout the complete vehicle lifecycle. A key component of the regulation is the establishment of a cybersecurity management system that includes, but is not limited to, the analysis of threats and risks, the development and implementation of appropriate countermeasures and monitoring and logging to analyze incidents. Additionally, sufficient testing of implemented cybersecurity measures must be performed to validate cybersecurity goals. This includes functional testing to ensure correct behavior according to a specification, and offensive testing to minimize unidentified vulnerabilities and weaknesses that could be exploited for malicious purposes.

The automotive industry faces the challenge of keeping up with the stipulations imposed by the cybersecurity regulations and standards. Often, cybersecurity issues are spotted late in development due to cybersecurity testing not being process-integrated enough into existing evaluation strategies, lack of guidelines on what and how to test, as well as a lack of a proper test environment. Late findings can be very expensive and even delay the start of production. Therefore, the automotive industry has begun to adopt a 'shift left' strategy by integrating cybersecurity aspects into the established test infrastructure. This avoids follow-up costs of late findings and reduces the costs of additional test platforms and personnel.

## Shielding connected cars

Adopting HIL and SIL offers significant benefits to a cybersecurity testing program

### Technical benefits:

- Real-time environment (HIL) to ensure deterministic and reproducible behavior
- Offline environment (SIL) to scale, use cloud, test even earlier
- Dynamically track the response of the device under test
- Functional simulation environment to drive the device under test in defined operation modes
- Bus and network support including MACsec, IPsec, TLS, SecOC

### Operational benefits:

- Leverage existing test infrastructure and processes
- 'Test early, test often' to reduce follow-up costs of late findings
- Reduce the need for dedicated cybersecurity workstations
- Address certain safety-security dependencies, increase the coverage and improve results
- SIL and HIL soft skills: reusability, scalability, automatable, remotely operable



## Tested for security

According to ISO/SAE 21434 specifications [RC-10-12], testing should be performed in order to minimize potential for unidentified vulnerabilities. Evaluation methods can include the following:

- Functional testing
- Vulnerability scanning
- Fuzz testing and/or
- Penetration testing

### Hack-proof

A major key to tackling current cybersecurity challenges is harmonizing the cybersecurity process with processes from standards such as ISO 26262 and ISO 21448 through a risk-driven methodology. Cybersecurity aspects can be integrated into existing test processes. From a testing perspective, this means using existing hardware-in-the-loop and software-in-the-loop platforms to conduct various cybersecurity tests continuously during development. For example, conformance testing, safety-security dependency testing, interface fuzzing with tools like PlaxidityX Security AutoTester integrated into dSPACE HIL and SIL toolchains, and penetration testing.

HIL systems have been widely used as test platforms for ECUs for many years, particularly in the automotive industry. A single vehicle contains dozens of ECUs, so HIL test systems have become an important part of the development cycle. With modern vehicles becoming more software-defined, it is crucial to test and validate software as early as possible. As a result, SIL testing becomes more important since it enables the user to test software functionalities without any ECU hardware.

Using the established HIL and SIL platforms for cybersecurity testing comes with several technical and operational benefits (see *Shielding connected cars*, left).

### Armor inventory

dSPACE and PlaxidityX (formerly Argus Cyber Security) recently joined forces to introduce new cybersecurity test

automation capabilities based on dSPACE's established Scalexio HIL and Veos SIL platforms and the PlaxidityX Security AutoTester. The joint solution provides ready-to-use fuzzing test cases for commonly used automotive bus and network protocols. It leverages PlaxidityX's extensive experience in security architecture and risk assessment, and its deep understanding of vehicle architectures.

Interface fuzzing focuses on the communication interfaces of the system being tested and enables search and identification of vulnerabilities and weaknesses, such as buffer and integer overflows, dynamic allocation issues, denial of service issues and security misconfigurations. Additionally, fuzzing tests the robustness of the target interfaces and provides automatically generated negative test cases when executed in a functional test environment.

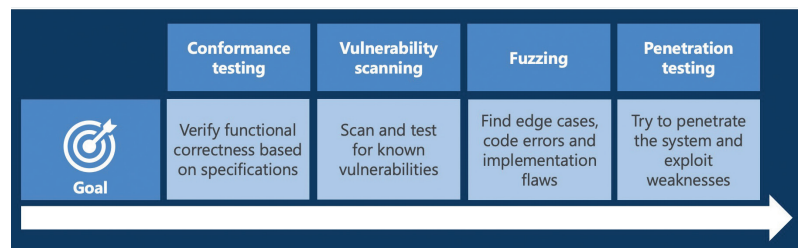
The basic principle of fuzzing is to feed invalid, unexpected or random data to the system under test (real or virtual ECU) and monitor its response behavior. Importantly, effective fuzzing needs to be protocol-aware enough to successfully pass into the system under test and, at the same time, carry data that is invalid enough to spot edge cases.

As fuzzing can be highly automated, it is well suited to act as an efficient cybersecurity quality gate at different stages of development using HIL and SIL test platforms. As one of the recommended test methods mentioned in ISO/SAE 21434, fuzz testing is an important pillar in an overall cybersecurity test strategy.

Complementary to HIL and SIL systems as cybersecurity test platforms, dSPACE Consulting supports process and test strategy definition. The main goal is to efficiently integrate the cybersecurity process into the customer's existing development process and harmonize it with industry best practices. dSPACE offers process consulting to define and implement standard-compliant workflows for cybersecurity, functional safety, ASPICE (automotive software process improvement and capability determination) and SOTIF (safety of the intended functionality). The portfolio also includes strategy consulting for selecting solutions, defining test strategies and implementing these into an end-to-end solution.

In conclusion, the dSPACE and PlaxidityX joint solution for HIL- and SIL-based cybersecurity testing enables cybersecurity testing to be conducted early and often during development, using the existing functional testing infrastructure and processes. This approach reduces costs for additional testing personnel, simulation hardware and lab space, and supports compliance with automotive cybersecurity regulations and standards. ◀

**BELOW:** dSPACE supports customers with test strategies to ensure compliance, offering versatile and open cybersecurity test platforms



## DYNAMOMETERS CAPTURE CRITICAL DATA DOWN TO 0RPM

### Force Control

Visit Force Control's booth at Automotive Testing Expo in Novi as the team presents its latest dynamometers featuring Positorq oil shear load brakes, which absorb extreme torque at very low speed, down to 0rpm. This allows them to accurately capture data at those critical junctures when dynos equipped with traditional load brakes cannot.

Oil shear technology can provide instant load spikes and

static lock-up of up to three times the continuous load rating. High cycle counts (up to 300 torque changes per minute) enable tests with a hammering effect on the tested subject. Quick, controllable response enables virtually unlimited test capabilities; extremely quiet operation allows gearbox, transmission and final drive noise testing.

High-torque, low-speed testing is commonly used for testing

lifecycles, shock loading and overall machine life/performance for snowmobiles, forklifts, two-/four-/six-wheel-drive tractors or tracked vehicles, commercial truck axles, helicopter transmissions, gun turrets, winches, hoists, hydraulic motors and more.

Proven oil shear technology eliminates wear for service-free endurance testing and requires no adjustment or cleanup of friction material dust.



Force Control can furnish a complete test stand including frame fabrication, controls, data acquisition and support, or basic components if test engineers prefer to handle certain aspects or components in-house.

**Booth 10026**

## COMPACT AND COST-EFFECTIVE DIGITAL TORQUE TRANSDUCERS

### S. Himmelstein & Company

Don't miss Himmelstein present its MCRT 48200V compact digital torque sensors, which deliver a short lead time, high accuracy, low noise, high overload capacity, high overrange, inherent noise tolerance and a wide temperature range.

Strain gauge sensing and non-contact signal transfer make them ideal for drivetrain and component testing, available in two accuracy grades:  $\pm 0.2\%$  and  $\pm 0.15\%$  of full scale. Installation can be floating or foot mounted with integral mounting base.

Null, scaling and units of measure are stored in non-volatile memory. There are



no noisy pots or switches, 10 common units of measure are supported without requiring recalibration and 11 user-selectable Bessel filters avoid delay distortion and overshoot errors.

Included software interfaces with Windows-based PCs, displaying and plotting real-time data. It can select  $\pm 5V$  or  $\pm 10V$  analog outputs, filters, scaling and units of measure, and/or control measurement.

Torque sensors and systems are calibrated CW and CCW to their full-scale capacity in the company's ISO/IEC 17025:2017-accredited laboratory.

**Booth 10030**



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## C-CT CURRENT TRANSDUCER FOR EV AND HEV TESTS

### Dewesoft

Dewesoft's team will present the DC-CT current transducer, made for EV and HEV tests on electromotors, inverters and charging systems. DC-CT provides all the advantages of a zero-flux current transducer but with lower power consumption and a more compact design.

With a broad measurement range, high bandwidth, excellent linearity, high accuracy and minimal temperature drift, it is one of the top current sensors available. Dewesoft's DAQ instruments record analog sensor and digital data from



CAN 2.0, CAN FD, FlexRay, GNSS, IMU sensors and video cameras. Applications include combustion, EV/HEV, noise testing, EMC chamber, durability, vehicle dynamics and ADAS.

Also on display will be the Obsidian high-end datalogger, which can act like a standalone

datalogger, real-time control system and signal-conditioning front end. It performs these tasks separately or simultaneously. It is ideal for fleet applications and long-term vehicle tests. The fanless Sirius X DAQ system features up to 32 input channels with sampling rates up to 200kS/s at 24bit resolution for high dynamic range. Other features include robust gigabit LAN network connectivity, power-over-ethernet, CAN and CAN FD, and PTPv2 synchronization for easy connection and expansion.

**Booth 13012**

## MEASURE 500+ TEMPERATURE POINTS WITH JUST ONE CABLE

### CSM Products

CSM will be showcasing the latest developments in its HV DTemp measurement system at this year's expo.

The company knows the importance of understanding thermal behavior and temperature curves when developing high-performance high-voltage battery systems, and how the acquisition of temperatures between cells and other vital points throughout the battery must be done safely to protect personnel and equipment.

The HV DTemp measurement system has been developed for the accurate, digital and thus



interference-free acquisition of up to 512 temperature measurement points via a single cable connection to the HV DTemp-P central unit, without the need for further modification of the battery housing. The complete system, HV-safe up to 1,000V DC, offers a measurement accuracy of  $\pm 0.1^\circ C$  to  $\pm 0.25^\circ C$ , allowing for exact tracking of temperature curves.

The very small temperature sensors can be applied precisely yet flexibly using a variety of methods including an ultra-thin, flexible circuit that can be customized for specific applications. The compact, robust design allows measurements to be taken at all levels. The system is suitable for use on test benches or installed in vehicles for road tests.

Visit the team at the show and see the impressive performance of HV DTemp.

**Booth 7001**

## HARNESSING DIGITAL TECHNOLOGY AND EXPERTISE FOR IMPRESSIVE EFFICIENCY

### Acutronic USA

➤ In today's fast-paced world, efficiency and reliability are paramount. Modern systems with fully digital controllers and amplifiers are revolutionizing industries by enabling seamless system tracking and facilitating predictive maintenance. This innovative technology ensures that potential issues are identified and addressed before they escalate, drastically reducing downtime and maintenance costs.

The modular design of the Acutronic digital power amplifier for shakers is a game-changer, with an IoT-ready design that enables extremely accurate predictions.

In the rare instance of a power module failure, the system's modularity enables continued operation at reduced power, maintaining productivity and ensuring operations are not brought to a standstill. The robust design not only enhances reliability but also provides peace of mind, as it is built to adapt and endure.

Behind this technology is a team of highly experienced service professionals situated across five countries. Their ability to service Acutronic systems and those of competitors speaks to their broad expertise and commitment to excellence.

Investing in advanced technology and comprehensive support ensures operations are seamless, costs are reduced and efficiency is unparalleled.

Find out more at the Acutronic booth in Novi. **Booth 7036**



## EFFICIENT TESTING OF HIGH-PERFORMANCE COMPUTING PLATFORMS

### Noffz Technologies

➤ Visit the Noffz booth and see how the shift to centralized electrical/electronic (E/E) architectures of vehicles reduces system complexity while increasing security.

Computing power for connectivity, electrification, shared mobility, automated and autonomous driving is centralized into fewer high-performance computers (HPCs). With higher levels of autonomy, more data from cameras, radars and wireless networks needs to be processed with low latency. Testing modern HPCs is challenging as they are the backbone of software-defined vehicles, combining internal and external communication in one device with fluid cooling.

Test and automation systems for innovative control units are Noffz's core competencies, integrating top measurement instruments with in-house products to create turnkey systems with flexible UTP software and global support.

Noffz's High-Speed Data Switch products set standards for efficiency. This centralized data source/sink mechanism streamlines tests for high-speed interfaces such as automotive ethernet, automotive SerDes, PCI Express (PCIe), video, USB and differential signals up to 12Gbps. Its SerDes tools cover new protocols GMSL2/3, FPD-Link III/IV and APIX-2/3, optimizing costs and space within high-channel-count tests, ensuring reliably tested electronic products.

**Booth 16000**



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## LIGHT VEHICLE DYNAMOMETER AND MICROMOBILITY DEVICE THERMOELECTRIC DYNAMOMETER

### S-E-A

➤ See the latest from S-E-A as it showcases its light vehicle dynamometer and micromobility device thermoelectric dynamometer at the expo. The machines have been designed to test a wide variety of micromobility devices and small vehicles such as hoverboards, electric bikes and skateboards, electric unicycles and youth ATVs.

Parameters that can be measured include distance traveled, top speed, voltages, currents and temperatures. Vehicles can be loaded with simulated driver weight and controlled via electrical actuators. These dynamometers are ideal to test the complexity and potential of these new vehicles on public roadways and sidewalks.

S-E-A will present these products alongside the Vehicle Inertia Measurement Facility (VIMF), automated test driver, STRIDE (Small Test Robot for Individuals in Dangerous Environments) and other services.

**Booth 11026**



## HIGH DYNAMIC SYSTEM FOR ENDURANCE TESTS

### Step Lab

➤ Visit the expo to see Step Lab's HUD020 – an electrodynamic testing actuator based on linear motors and engineered for high dynamic characterization and durability tests. Designed to deal with the most demanding testing conditions, it handles peak loads of 22kN, continuous dynamic forces up to 8kN and test speeds exceeding 6.5m/s. The HUD020 includes a closed-loop control system for force and position, high-resolution data acquisition and flexible programming through the Test Center graphic interface to meet the requirements of comprehensive damper and shock absorber testing.

In addition to sinusoidal waveforms, the Step Lab HUD series can reproduce triangular,

square and polynomial waveforms, and random profiles (real-track data), enabling precise control and adaptability in various test scenarios. Different mounting options for the actuator and controller, along with a variety of grips, tools, load cells and sensors, enhance its versatility and extend its application into multi-actuator systems.

The HUD020 is suitable for high dynamic characterization and durability testing of shock absorbers in the automotive, motorcycle, motorsport and heavy transportation industries. The powerful controller enables integration into advanced HIL testing systems.

Explore the advantages offered by this series in Novi this autumn.

**Booth 11033**

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## NEW IN-CABIN ACOUSTIC TESTING AND DATA ACQUISITION SOLUTIONS

### Axiometrix Solutions

Discover the latest test and measurement solutions from the Axiometrix Solutions brands, GRAS and imc, as they address in-cabin acoustic testing and data acquisition for mobile and stationary tests and for data acquisition on rotating components.

Endorsed by the Audio Engineering Society (AES), the latest GRAS 46BL-1 1/4" microphone provides industry-leading low self-noise, setting a new standard for in-cabin acoustic testing. This measurement solution complements the GRAS portfolio of measurement microphones, which are used for a wide range of acoustic testing applications in EV, HEV and ICE vehicles. These microphones provide superior sound quality analysis, from standardized tests to in-cabin noise assessments and brake noise evaluations.

imc's automotive test solutions include fatigue and durability measurements, road load data, vehicle dynamics, and e-motor and battery testing. The new imc ARGUSfit B-4 bridge and strain-gauge amplifier supports all bridge and

strain gauge modes for fatigue strength analysis. It complements the modular, extremely compact imc ARGUSfit system. For durability testing on rotating parts, the imc Dx telemetry system ensures reliable wireless data transmission from temperature and voltage sensors.

Take a trip to the Axiometrix Solutions booth at Automotive Testing Expo in Novi and see the cutting-edge technical products from this leading full-service provider of test and measurement solutions.

**Booth 4048**

## AUTOMATED PRECISION TESTING AND REPORTING FOR BEV RANGE DETECTION

### Stähle

Stähle will unveil its latest advances in accurate and efficient BEV range testing at the expo in October.

Identifying the range of battery electric vehicles involves long-duration speed trace tests on a chassis dynamometer. The efficiency and larger battery capacities of modern BEVs have extended the duration of tests, requiring drivers to maintain consistent, precise and repeatable performance for several hours. Post-processing and test protocol generation are complex due to varying regional regulations. Stähle conducts BEV range detection using multiple WLTC and other cycles, combined with steady-state speed phases to deplete the battery to specific state-of-charge (SOC) levels. The challenges for BEV test drivers are similar to those faced by drivers in combustion vehicle emission

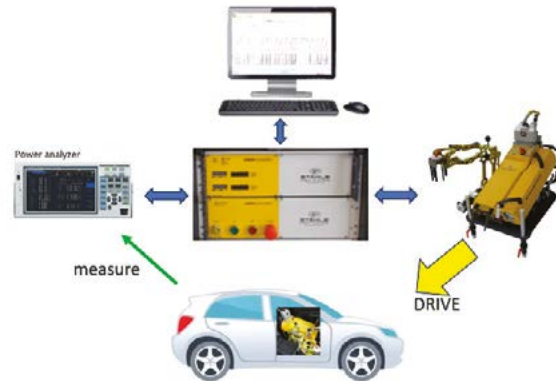
tests but much longer in duration. Driver performance must meet SAE J2951 standards, focusing on consistent speed tolerance.

BEV range tests end when the vehicle's battery charge is too low to follow the speed trace, requiring a defined termination method. Certification procedures vary by country, increasing the complexity. Development also necessitates measuring electric power conditions at various points in the vehicle powertrain and battery system using power analyzers.

The Stähle autopilot system automates EV range and certification test procedures, ensuring precise, repeatable driving 24/7. It integrates with Hioki power analyzers for real-time data collection and generates comprehensive test reports compliant with national regulations. The system replicates human driving styles and integrates with test cell automation systems such as iGEM, MPAS and VETS.

Speak to the Stähle team at the show in Novi to find out more.

**Booth 5012**



## INNOVATIVE PROVING GROUND MANAGEMENT

### mm-lab

After a successful show in 2023 and the first installation of a proving ground management system (PGMS) in the USA, mm-lab is once again taking part in Automotive Testing Expo North America and presenting its latest achievements and innovations.

On display will be innovative advances including the installation of mm-lab's PGMS at FT Techno of America's Fowlerville Proving Ground; a lightweight, improved onboard unit; a new management dashboard for visualization of



proving ground KPIs; a workshop order system; CCTV control; integrated durability and endurance test guidance – the optimal tool for successful durability/endurance test

execution; BookSmart, with a focus on management of commercial proving ground processes (booking, planning, billing); and details of new customers, partnerships and projects.

In June 2024, mm-lab was awarded the Innovation Project of the Year 2024 by the German Federal Ministry of Economics and Climate Protection.

The team will be giving live demonstrations of the company's proving ground solutions on all three exhibition days.

**Booth 11036**



## NEW CAPACITIVE GAP SENSOR MEASURES GAPS DOWN TO 100MM

### Capacitec

Capacitec will unveil the GPD-1.5SW(.004)-A-150 at the expo. The company's thinnest back-to-back capacitive gap sensor ever features a flexible 0.0040in (100µm) thickness capacitive sensor wand designed to virtually eliminate tilt error. Ideal applications include gap measurements in slot die coaters for EV battery production, tight

aerospace composite structural component interfaces and tape coating manufacturing operations such as roll-to-roll measurements.



GPD-1.5SW has symmetrical back-to-back capacitive sensors to measure into 5.9in-deep (150mm) gap positions that are as thin as a piece of paper. Capacitec's newest portable Gapman Gen4 (with BT 4.0) supports these super-thin-gap sensor wands. Customers can select a gap range of 1,000µm or 500µm with resultant resolutions of 100nm or 50nm.

The new super-thin-gap sensor technology is also available in application-specific multipoint sensor configurations of up to eight integrated positions with the Gapman Gen4M.

Discover how Capacitec's spatially positioned sensors could increase productivity, quality and ROI on the manufacturing floor.

**Booth 6044**

## CHASSIS DYNAMOMETER FOR DRIVE TECHNOLOGIES

### Horiba

Visit Horiba's booth to find out how the company's continuous optimization and improvement of tried-and-tested designs has led to the next generation of high-performance, customizable chassis dynamometers, the Vulcan Compact LDV 4x4.

With patented synchronous motor technology in each roller, the Vulcan Compact LDV 4x4 fulfills the technical requirements for high performance ranges with a small installation space. Plus, the efficient cooling system is based on water cooling, obviating the need for a ventilation system.

By fitting into existing pits, the Vulcan Compact LDV 4x4 can test hybrid, battery and fuel cell electric vehicles with no necessary building modifications. The power on the single axles (four-quadrant operation) has been increased for power checks on EVs. Traditional emissions testing is still possible with this design,

but now NVH and performance testing for LDVs, MDVs and two-wheelers up to 350km/h can also be performed.

In comparison with its predecessor, the new-generation Vulcan allows significantly smoother torque distribution due to its 24 poles.

Furthermore, different speeds can be run on each roll to simulate driving a curve, with different accelerations on each tire to check the vehicle control system in icy road simulations.

**Booth 12004**



## INNOVATIVE WHIPLASH TESTING WITH COMPACT IMPACT SLED

### Messring

See the latest from Messring as it unveils its new Compact Impact Sled (CIS) with a low-g module, revolutionizing whiplash testing in the automotive industry. At just 17.6m long, this sled eliminates the need for a foundation, industrial air

compressor or dryer, making it a compact and effective solution for various testing environments. It's also ideal for conducting FMVSS 213a and 213b child seat tests. Complementing the sled are Messring's ultra-light titanium seatbelt load cells, featuring a quick-change cable system to ensure swift and seamless adjustments during testing.

Also on display will be Messring's M=Light Evo LED lamps, which are designed for enhanced illumination with a lower power draw. They come in three distinct lens configurations, catering to diverse lighting needs. This suite of innovations underscores Messring's commitment to advancing safety testing technology.

Learn more at the company's booth in Novi this autumn.

**Booth 6028**

## TESTING PRODUCTS UNDER PRESSURE

### Innkeeper

As hybrid power system usage increases, component cooling and fluid containment issues arise. Innkeeper has advanced pressure testing equipment development to address these challenges.

Durability and performance testing of components and



subsystems require precise control of fluid pressure, flow and temperature to analyze performance under stress. Test systems with these features aren't purchased off the shelf; they're unique due to the nuances of each component under test.

Innkeeper supplies pressure testing equipment with elements that differentiate it from other suppliers: its modular approach to equipment design enables a cost-effective custom build. Using

a common control and data acquisition system, InnControl, an intuitive interface, allows test engineers to build and modify sequences quickly for each test permutation. Both sequential logic and real-time closed-loop control interface with pressure and flow devices, optimizing capital costs. Static, quasi-static or dynamic pressure requirements are met with simultaneous specimens, flow and temperature regulation.

**Booth 16020**

The future of **automotive testing** ★ CONFERENCE ★

Speaker spotlight

**CURTIS HAY**

Technical fellow, GM, USA



Presentation title:  
Test and evaluation of inertial sensor performance for active safety applications

**FREE for OEMs & Tier 1s**

Speaker spotlight

**JOHN KWANT**

Executive director, Americas, 5GAA, USA



Presentation title:  
V2X – What automotive testing engineers need to know about 5GAA policy

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**PRECISE DATA ACQUISITION FOR AUTOMOTIVE TESTING**

Dewetron

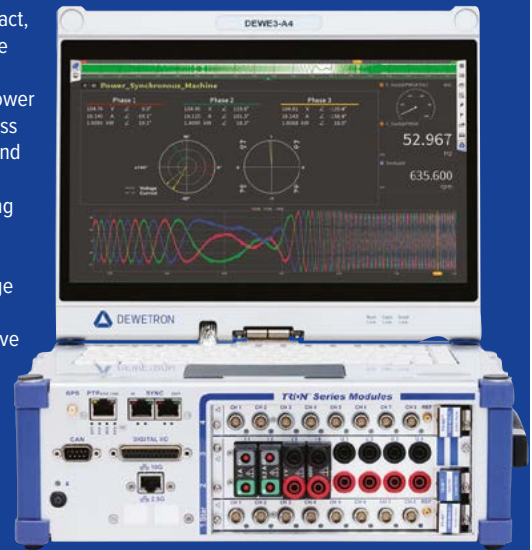
In the fast-paced automotive industry, precise data acquisition and analysis are crucial to the development and optimization process. Data acquisition in automotive testing covers a wide range of applications such as power analysis, NVH measurements, vehicle dynamics and durability. As electromobility is increasingly important, recording electrical parameters is essential not only on the test bench but also during real-world test drives.

For in-vehicle measurements, compact, space-saving measurement devices are vital. These DAQ systems require low power consumption or independent power sources, multiple interfaces for seamless communication with vehicle sensors, and high accuracy for reliable data. On the test bench, versatility and high sampling rates are crucial for capturing dynamic processes. Fast data transmission and ample storage capacity handle the large volumes of data generated.

For those looking to source innovative measurement systems tailored for the automotive industry, a visit to the Dewetron booth is a must. The company's solutions include customizable chassis, versatile measurement modules and powerful Oxygen software for comprehensive data visualization and analysis.

Dewetron's technology ensures precise and reliable measurements, ideal for test bench and on-road applications. Its modular and flexible design provides optimal solutions for road tests and development and end-of-line test benches, making them the ideal choice for automotive data acquisition.

Meet the Dewetron team at Automotive Testing Expo this October.  
**Booth 12016**



**SMART VIBRATION MEASUREMENT TECHNOLOGY**

Optomet

At the expo, Optomet will unveil its new Smart series, revolutionizing vibration measurement technology. This innovative product line integrates all the essential components of NVH measurement into one compact device, ensuring highly accurate vibration measurements and user-friendliness. Each Smart series vibrometer is a multipurpose measurement instrument, integrating data acquisition and signal generator functionality on up to eight or 15 channels, depending on the model. The devices are smaller and lighter than others on the market, making them ideal for both laboratory and field use.

The Smart series fully integrates software and hardware,

enabling precise and synchronous data acquisition. Users can flexibly adjust the number of vibrometers and expand their systems as needed. The central software solution, Smart Lab, enables simultaneous control of multiple

vibrometers and supports the entire measurement process with importable 3D models. Advanced technologies and intelligent signal processing algorithms ensure the highest precision and efficiency, allowing even inexperienced users

to quickly obtain reliable measurement results.

With the Smart series, Optomet sets new standards and remains a leading provider of vibration measurement solutions.

**Booth 3012**



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## MIXED-SIGNAL OSCILLOSCOPE FOR EV MOTOR CONTROL DESIGN

### Uni-Trend Technology US

The Uni-Trend MSO3054X mixed-signal oscilloscope is transforming motor controller design for electric vehicles. This advanced instrument captures and analyzes complex signals, crucial for efficient and reliable motor control systems. Check out this impressive development at the company's booth at Automotive Testing Expo North America.

With a 500MHz bandwidth and a sample rate of up to 5GSa/s, the MSO3054X accurately captures fast transients and high-frequency components in motor control signals, essential for optimizing pulse-width modulation (PWM) signals. Its sophisticated triggering options allow engineers to pinpoint anomalies within motor control circuits, which is crucial for debugging and ensuring robust designs.

The oscilloscope's data analysis tools, including automatic measurements, math functions and waveform histograms, streamline signal evaluation. These features accelerate troubleshooting and enhance design validation, providing engineers with quick insights into system behavior.

Using the MSO3054X leads to faster development cycles, as engineers can swiftly identify and resolve issues. This results in optimized motor control systems, improved EV performance and significant cost savings by reducing development time and resources.

Catch up with the latest from Uni-Trend Technology US at the expo and see how its tools could benefit EV motor controller engineers, enhancing design efficiency and reliability.

**Booth 9038**



## INNOVATIVE TECHNOLOGY FOR TEST RIG APPLICATIONS

### Voith US

Test engineering is crucial for product development and validation across industries. Ranging from a few hundred watts to over 30MW, Voith drive systems are integral to development and end-of-line test rigs.

Check out Voith's extensive product portfolio for the testing sector, which includes highly flexible couplings to dampen torsional vibrations and torque shocks, safeguarding driveline components and extending their lifespan; torque limiting couplings, with capacities from 1 to 20,000kNm, protecting people and equipment during potentially catastrophic system overloads; universal joint shafts, capable of transmitting power in drives



with offset shafts, with torque capacities exceeding 20,000kNm (14,000,000 lbf-ft);

connection couplings to facilitate torque transmission across driveline joints without backlash, allowing quick disconnection; hydraulic systems and self-contained servo drives for diverse applications; and Elin Motoren, a Voith company that manufactures asynchronous and synchronous induction motors, from 50kW to 60MVA and recognized globally for quality.

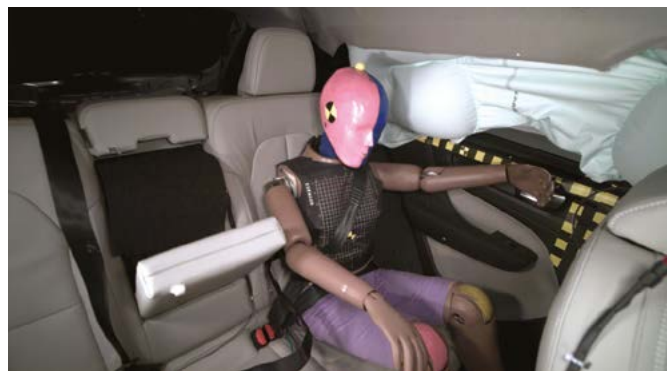
Talk to Voith at the expo and tap in to the benefits of years of being a trusted partner for drive system components and fluid power solutions in the test engineering sector.

**Booth 10048**



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## ADVANCED VEHICLE SAFETY MEASURES

### XSensor Technology

With the recent update to the crash test protocol – Moderate Overlap Frontal Crashworthiness Evaluation – by the Insurance Institute for Highway Safety (IIHS), the increased focus on enhanced protection for front and rear vehicle occupants is helping shape developments at XSensor Technology.

The company's High-Speed (HS) Impact system has been integrated into this updated protocol to measure dynamic belt position and movement on anthropomorphic test devices (ATDs) during crash scenarios. This enables safety engineers and vehicle designers to assess seatbelt movement and positioning during impact testing.

During vehicle crash tests, the HS Impact system provides comprehensive hardware and software solutions to visualize impact pressures and measure applied pressures from seatbelts, airbag deployments and other vehicle surfaces.

With thousands of sensing points capturing impact data, designers and engineers can pinpoint issues, implement effective modifications and refine designs to improve injury predictions.

Connect with the XSensor team at the expo and see the advances it is making in vehicle safety for all occupants.

**Booth 14018**

## INNOVATIVE POWER CONVERTER TECHNOLOGY FOR CHALLENGING TESTING TASKS

### KS Engineers

Known for comprehensive solutions for automotive testing and energy systems, KS Engineers will reveal its latest converter technology at this year's expo.

Having recently established a US office, the company has brought its new KS-AMPS (advanced modular power system) converter technology to the market. A core component of the KS-R2R high-performance testing technology, it provides realistic testing of complete vehicles, powertrains, energy sources

and converters. The modular system can be customized and flexibly configured for applications using the proprietary PowerCubes with SiC technology. Battery simulators, frequency converters and electric motor emulators for inverter testing can be built and scaled in terms of power.

Its advantages lie in battery test systems: in combination with DC



grids and a switching matrix, highest efficiency is achieved with minimum component use, and operators benefit from maximum flexibility and reliability. The switching matrix allows demand-driven allocation of DC power to individual testbeds and a switchover to alternative DC branches for maintenance purposes in the supply network.

**Booth 3014**

## NATURAL REFRIGERANTS IN TEMPERATURE CONTROL SYSTEMS

### Huber

As a leader in developing and producing temperature control systems, Huber will showcase its high-precision temperature control solutions, customized for the needs of the automotive industry and featuring natural refrigerants as standard.

Demonstrating its commitment to leading the implementation of eco-friendly, sustainable solutions, Huber USA will feature its Unimotive product line at this year's expo, including the Green Line (GL) model variant, which uses the natural refrigerant carbon dioxide. CO<sub>2</sub> is an environmentally friendly alternative to synthetic refrigerants and has no ozone depletion potential and negligible global warming potential. It is also non-flammable, non-toxic and chemically inactive.

The Unimotive product series is specially designed for applications in the automotive industry, including temperature simulations, material tests, and stress and load tests. These models use water-glycol at temperatures ranging from -45°C to +150°C. Unimotive has optional add-ons, including the flow control cube (FCC) to control the flow rate of water-glycol to the application, and the automated drain & refill system (ADR), which allows the application to be drained and refilled automatically.

Visit the team in Novi and find the perfect temperature control system solution for your needs. **Booth 12036**



## ADVANCED IMAGING SOLUTIONS

### Photron

Photron is a global leader in high-speed imaging technology and will introduce its the latest in its Fastcam camera range – the Fastcam Mini R5-4K – at the expo.

Photron excels in offering a wide range of high-speed digital camera systems. Its camera technology is used by top research labs, industrial facilities and universities in more than 30 countries.

This latest innovation is designed to capture large fields of view without sacrificing image quality. It features a proprietary 4K/UHD sensor, ideal for off-board and onboard vehicle impact safety testing, fluid dynamics and material testing. Capturing 12bit images at up to 1,250fps with full 4K resolution (4096 x 2304 pixels), it can record up to 200,000fps at lower resolutions. Compact and durable, the Fastcam Mini R5-4K withstands forces of up to 100g and provides exceptional light sensitivity and image quality in the competitive high-speed camera market. It really is a must-see camera solution.

**Booth 12018**



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## MINIMAL CABLES WITH IN-DUMMY DAS

### Diversified Technical Systems

As channel counts continue to rise and the number of ATDs required per test increases, in-dummy DAS offers cost- and time-saving benefits. DTS will showcase the advantages of its new ATDs with SLICE6 in-dummy DAS at the expo.

Integrating SLICE6 DAS reduces in-dummy cabling by up to 75%, which reduces mass and potential points of failure. Plus, a single exit cable replaces the bulky mass of trailing umbilical cables that affect dummy positioning and target weight.

Quicker test setup times help keep test schedules on track, often

with fewer ATDs in the fleet. The DTS SLICE6 system also features integrated tilt sensors for easier ATD positioning.



Eliminating connectors and trailing cables that can alter test dynamics also means fewer problems and less noise for improved data quality. Kits are customized to support global, US and Euro NCAP configurations and more.

Chat to the DTS team at Automotive Testing Expo to learn more about retrofitting or purchasing new ATDs with SLICE6 in-dummy DAS. Plus, don't miss the DTS Innovation Room featuring the company's latest products and training events.

**Booth 15008**

## IMPROVED VISUAL DATA ACQUISITION

### Denkei Corporation Americas

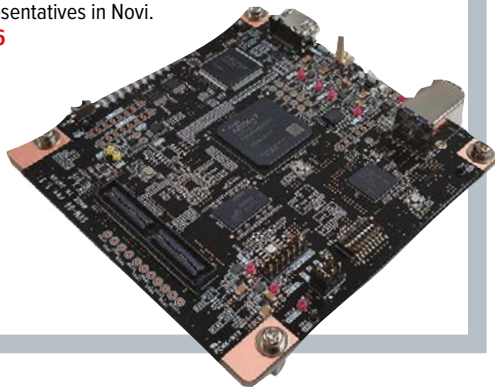
Cars are rapidly evolving into increasingly complex machines with a litany of safety features guarding against unpredictable environments and human error. As these features and the computers powering them become more powerful and versatile, they demand more complex and detailed visual data about their surroundings; ergo, cameras are essential to this evolution.

The bandwidth to transmit and receive this data is a source of tension in modern vehicle design for both testing and implementation, which NetVision seeks to address. Its SVO-06 generator board converts pre-recorded footage to a serialized signal emulating cameras of various settings, including MIPI A-PHY/D-PHY, GMSL, FPD-Link and GVIF. Conversely, its SVM-06 monitoring board accepts video signals corresponding to the aforementioned interfaces and seamlessly converts and conveys this information to a vehicle's ECU; a 10Gbps-compatible board is in development to handle higher bandwidths.

Without complex, detailed visual data, modern vehicle safety features cannot operate at their full potential. Through SerDes technology, NetVision seeks to help automotive designers achieve that potential. The SVO-06 simplifies the testing of numerous cameras and settings, while the SVM-06 facilitates the smooth transmission of environmental data in practice.

See the range and find out more from Denkei Corporation Americas representatives in Novi.

**Booth 15016**



## ENGINEERING AND TEST VALIDATION MODULE

### Canfigure

Visit Canfigure's booth at the expo to find the ideal solution for managing the end-to-end process of planning, testing and validating products. The Canfigure Engineering and Test Validation Module ensures compliance with EMC testing, with functions including complete test scheduling, D8 defect management and DVP reporting.

Workflow processes include ship and return of equipment to external vendors, and storage and retrieval of parts from the warehouse. Equipment used for tests can be booked and reserved, along with the systems involved in the testing process.

Canfigure experts will be on hand to discuss visitors' detailed DVP&R report requirements and explain more about the company's test and validation features.

Canfigure is a 100% web-based application that can be installed on a client's internal network or accessed via its secure cloud infrastructure. Find out more in Novi.

**Booth 7026**

## INNOVATIVE SERVOHYDRAULIC ACTUATORS FOR TEST SYSTEMS

### Herbert Hänchen

Herbert Hänchen, a trusted German manufacturer of one of the largest test actuator ranges on the market, will present its new Servoseal sealing element, a dynamically sealing synthetic ring. The integrated retaining ring made of carbon prevents excessive pressure build-up on the sealing surface due to hydraulic pressure. At small amplitudes, no wear or scoring is produced on the counter-faces due to lack of lubrication, meaning it can be used in the sleek servo actuator series 120 and 300 just as well as in the testing actuator series 320.

This gives users a cost-effective and extremely powerful alternative to other actuator brands. These servo actuators enable testing tasks with small amplitudes and frequencies up to 25Hz, low side loads and long strokes, delivering advantages including low friction,



low wear and no leakage or functional oil. Hänchen offers a wide range of actuator dimensions in this series.

It is possible to equip the customary hydrostatic testing actuators of the 320 series for highly dynamic movements and high side loads with the Servoseal and thus achieve better hydraulic efficiency. Furthermore, a smaller control valve may often be used, as there is no functional oil flow and no leakage of the gap seal.

**Booth 6042**

## HIGH-VOLTAGE BATTERY SIMULATOR DISCONNECT PANEL

### ACS

To meet the growing need for equipment to handle higher voltages and currents, ACS has developed a high-voltage battery simulator disconnect panel (BSDP).

The BSDP handles 1,500V and 2,000A, which is crucial for testing advanced EV technologies. It achieves performance Level D, Category 3 (PLD Cat 3) safety certification; safety mechanisms include door switches. Voltage testers have been eliminated, preventing accidental exposure to live components, and motor-operated disconnect reduces the need for direct personal interaction with high-voltage components. Custom-machined copper bus bars ensure efficient electrical connections for reliable operation.

The BSDP is scalable and adaptable. It can supply additional power to multiple battery simulators, which will be essential as battery technology and testing evolves.

The BSDP efficiently and safely manages higher voltage levels,

making it a valuable tool for EV battery testing. Its advanced safety features and adaptable design reduce the need for frequent equipment upgrades, saving time and resources.

Don't miss this significant advance in EV testing technology. Visit ACS at Automotive Testing Expo and find solutions to EV testing challenges.

**Booth 9022**





## NAVIGATE ANYWHERE

### OxTS

Released earlier in 2024, the RT3000 v4 is OxTS's latest and most accurate GNSS/INS. Through a combination of survey-grade GNSS receivers, OxTS's IMU10 technology and over 25 years of navigation experience, RT3000 v4 customers benefit from uninterrupted position, orientation and motion data in open-sky and GNSS-denied environments.

Free post-processing software, optional integration with the RT-Range suite and a wide variety of driving robot integration options give users an easy-to-use, flexible and comprehensive ADAS testing solution that can be repurposed for many different tests.

Furthermore, the RT3000 v4 gets to specification within three minutes of low dynamics movement, meaning users can spend more time testing. It can be shipped globally without the need for export licenses, cutting down the time taken to navigate tricky export processes. Stop by OxTS's booth at Automotive Testing Expo to find out more.

**Booth 14008**

## ENERGY-EFFICIENT TESTING FOR COMMERCIAL VEHICLES

### Empulse

Empulse will unveil its latest testing innovation in Novi. The seaPLUS series is specifically designed for commercial vehicle testing, including heavier EVs, heavy trucks and commercial vehicles. It sets a new benchmark in testing with 46% higher performance over the previous series, enhancing durability and expanding testing capabilities across a wider range of applications and industries.

By leveraging its advanced servo-electric actuation technology, Empulse has created a sustainable solution that significantly reduces energy consumption compared with traditional methods. Its servo-electric systems use only 20% of the electrical energy of hydraulic systems.

Empulse has an extensive history of creating smarter, more sustainable servo-electric testing solutions that have been recognized globally for over 40 years. With this launch, the company is setting a new standard for the industry, reinforcing its market-leading position in SEA test equipment.

Join the team at this year's expo and experience firsthand how this new product series can revolutionize testing for commercial vehicles.

**Booth 8060**



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## FREE-TO-ATTEND INNOVATION SHOWCASE

The stage will feature special short sessions and showcases on the expo floor, highlighting innovative concepts, prototypes, emerging technologies and future trends that could shape automotive testing.

Sessions in 2024 are set to include: innovations in automotive testing,

safety and compliance, autonomous and connected vehicles testing, software verification and validation, electric vehicle testing, data-driven testing and analytics, cybersecurity testing, environmental testing and durability, industry collaboration and best practices.



## The future of automotive testing CONFERENCE

### Speaker spotlight

### VINCENT SABATINI

High-voltage systems test engineer, Ford Motor Company, USA



Presentation title: Method for validating EVs using high-voltage battery simulation

This presentation summarizes a test solution developed at Ford Motor Company that enables high-voltage system/vehicle lab testing without requiring full, physical batteries. The test solution saves significant costs on prototype parts and vehicles, increases testing capability, speeds up testing and development timelines and increases user safety. It is also more environmentally sustainable and flexible for continued electric vehicle development. It allows Ford to tackle its quality improvement goals.

**Free for OEMs and Tier 1s**

## E-DRIVE DESIGN, TESTING AND VALIDATION WITH HIL

### Typhoon HIL

Visit Typhoon HIL and discover a best-in-class vertically integrated solution provider, supporting all your model-based electric powertrain engineering design, testing and validation needs in a virtual domain. Built to solve the most demanding e-mobility application requirements with futureproof connectivity options, the company's e-drive HIL testbed gives users the ability to perform e-drive simulation, condition signals between HIL and ECU, simulate faults and temperature measurements, and insert hardware faults.

With the highest-fidelity simulation, communication interfaces and a variety of signal types, ECUs can be tested with production-grade firmware and operation can be validated through all testing points. With the integration of fault insertion, temperature emulation and test automation, these benches provide the perfect interface for validating e-drive control software per ISO 26262 requirements.

Talk to the Typhoon HIL team and learn how to reduce development timelines and mitigate risk by leveraging the e-drive HIL testbed, allowing teams to focus on reinventing the future of electrified transportation.

**Booth 6024**

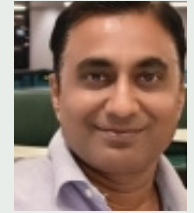


## The future of **automotive testing** ★ CONFERENCE ★

### Speaker spotlight

## PANKAJ SHARMA

General manager, Maruti Suzuki, India



Presentation title:  
Concurrent durability  
vehicle testing at  
component level

In the realm of automotive engineering, the pursuit of optimization and efficiency is relentless. Traditional vehicle component testing methodologies often involve the use of separate testing rigs for individual components. This approach, although methodical, can lead to increased development time and resource allocation.

In this presentation, Sharma will explore the benefits of transitioning to concurrent testing and how it stands as an innovative solution for overall improvement in the vehicle development process. Concurrent testing represents a paradigm shift in vehicle component testing, by implementing a system where multiple components can be tested at once. Visit the website for conference updates

**FREE for OEMs and Tier 1s**

## NEW! THE FUTURE OF AUTOMOTIVE TESTING CONFERENCE 2024

Brand new for 2024, this event will consist of pre-conference technical workshops (October 22) and a two-day conference with panel discussions and keynotes (October 23 and 24). The Future of Automotive Testing Conference will be the foremost gathering of industry leaders, innovators, researchers and professionals involved in automotive testing, validation and quality assurance. It will explore the latest advances, emerging trends and future challenges shaping the automotive testing landscape.

### Key themes:

- Innovations in automotive testing
- Safety and compliance
- Autonomous and connected vehicle testing
- Electric vehicle testing
- Data-driven testing and analytics
- Agile testing and rapid prototyping
- Environmental testing and durability
- Industry collaboration and best practices

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Visit the website to stay up-to-date with the latest developments

The conference will feature speakers from companies including...



The future of **automotive**  
**testing** ★ CONFERENCE ★

## WHAT TO EXPECT

### At the conference

**Keynote presentations:** Renowned industry leaders, innovators and experts will deliver keynote presentations, offering strategic insights into the future of automotive testing, highlighting emerging trends and sharing their vision for the industry.

**Panel discussions:** Interactive panel discussions will feature diverse perspectives from OEMs, suppliers, testing laboratories, research institutions and regulatory bodies. Topics will cover a wide range of issues, including autonomous vehicles, electric vehicle testing, safety and compliance, and the role of data analytics in testing.

**Technical sessions:** In-depth technical sessions will delve into topics related to automotive testing, providing attendees with practical knowledge, case studies and best practices. The sessions will cover areas such as simulation and virtual testing, environmental testing, agile testing methodologies and advanced sensor technologies.

**Networking opportunities:** The conference will provide ample networking opportunities for attendees to connect with peers, industry experts and potential collaborators. Networking sessions, coffee breaks and social events will facilitate meaningful interactions, knowledge sharing and collaboration.

### On the show floor

**Innovation showcases:** Special short sessions or showcases will highlight innovative concepts, prototypes and future trends in automotive testing. These sessions will offer a glimpse into emerging technologies and concepts that could shape the future of automotive testing.



### Program overview

#### Key themes:

- Innovations in automotive testing
- Safety and compliance
- Autonomous and connected vehicle testing
- Electric vehicle testing
- Data-driven testing and analytics
- Agile testing and rapid prototyping
- Environmental testing and durability
- Industry collaboration and best practices

### Who should attend

- Automotive OEMs
- Automotive suppliers and component manufacturers
- Testing laboratories and service providers
- Research institutions and academics
- Regulatory bodies and government agencies
- Technology providers and solution vendors
- Cybersecurity experts and data analysts
- Industry consultants and advisors
- Startups and innovators

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## PROPOSED PROGRAM

### DAY 1, OCTOBER 22

#### Pre-conference workshops

**AI-driven testing techniques:** Explore practical applications of artificial intelligence (AI) in automotive testing through hands-on exercises and demonstrations. Participants will learn how to implement AI-driven test automation, anomaly detection and predictive analytics.

**Cybersecurity testing lab:** A practical workshop on cybersecurity testing for connected vehicles.

**Introduction to V2X communication testing:** A workshop introducing participants to vehicle-to-everything (V2X) communication testing techniques. Participants will learn how to set up V2X communication systems, perform interoperability testing and validate communication protocols.

### DAY 2, OCTOBER 23

#### Opening plenary session

**09:00 – 11:00**

**Driving innovation:** The future of automotive testing

**Data-driven testing:** Leveraging analytics for enhanced performance and reliability

**Collaboration and partnership:** Driving industry innovation through collective efforts

**11:00 – 11:30 Networking break****11:30 – 13:00 Session 1 – Technology innovations in automotive testing**

**Simulation and virtual testing:** Explore the latest advances in simulation tools and virtual testing platforms for automotive applications. Discuss how virtual testing can accelerate product development cycles and reduce costs.

**AI-driven testing:** Delve into the role of artificial intelligence (AI) in automotive testing, including AI-driven test automation, anomaly detection and predictive analytics. Explore case studies highlighting the benefits of AI in optimizing testing processes.

**13:00 – 14:30 Lunch break****14:30 – 16:30 Session 2 – Future of mobility testing**

**Autonomous vehicle testing:** Explore the unique challenges and testing requirements associated with autonomous vehicles, including scenario-based testing, validation of AI algorithms and real-world simulation. Discuss strategies for ensuring the safety and reliability of autonomous systems.

**Electric vehicle testing:** Delve into testing methodologies for electric vehicles, including battery performance testing, charging infrastructure validation and range verification. Address sustainability considerations and environmental impact assessment in EV testing.

**Connected vehicle testing:** Discuss testing strategies for connected vehicles, including interoperability testing and robustness validation. Explore the role of connected vehicle technology in enhancing safety and efficiency on the road.

### DAY 3, OCTOBER 24

**10:00 – 13:00 Safety and compliance**

**Crash testing and safety validation:** Explore the latest trends and best practices in crash testing methodologies, including simulation-based crash testing, crashworthiness assessment and occupant safety evaluation.

**Cybersecurity testing:** Discuss strategies for cybersecurity testing in connected vehicles, including vulnerability assessments, penetration testing and secure communication protocols. Address the importance of safeguarding vehicle systems from cyber threats.

**Regulatory compliance and standards:** Examine regulatory requirements and industry standards governing automotive testing, including safety standards (e.g. ISO 26262), emissions regulations and data privacy regulations. Discuss approaches for ensuring compliance and certification.

*Program subject to change. Visit the website to stay up to date with the latest developments*



# automotive testing expo

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