

Press release

Innovating motorsports vehicle and tire testing: Kistler presents new wheel force transducer

New RoaDyn Racing WFT is ready-to-measure in one minute

Winterthur, December 2024

With the new RoaDyn Racing wheel force transducer (WFT) for motorsport testing applications, Kistler now offers a fully self-contained measuring wheel that teams, race car engineers and tire manufacturers can rely on. With an installation time of less than 60 seconds, the new device fits seamlessly into the racing environment, requiring no external systems or complex setup. It provides users with accurate data acquisition, providing critical insight into wheel forces and vehicle dynamics. Already used in GT3 and tested in Formula E, the RoaDyn Racing WFT enhances performance development proven to withstand the rough racing conditions.

From 0 to 100kph in a blistering 2.5 seconds: drivers of racing cars navigate tight corners at breathtaking speeds. The explosive power and rapid acceleration of race cars showcase the pinnacle of engineering, where every detail is meticulously crafted to push the limits of performance and speed. With such intense pressure on both vehicle and tires in motorsport, precise data collection is crucial to prevent tire blowouts, mechanical failures, and accidents. By monitoring tire loads and behavior, engineers can optimize cars ensuring the safety of drivers and spectators alike. Additionally, teams can better adapt their race strategies to maximize their chances of winning. The generated data also provides crucial insights into vehicle dynamics such as balance and stability. By analyzing longitudinal and lateral dynamics, including sideslip and drift angles, manufacturers can fine-tune chassis and control systems like ABS and TC, ensuring stable handling during sudden, highly dynamic drive manoeuvres.

Understanding the complex dynamics of wheel forces is essential. Only with advanced tools can motorsport teams navigate the intricate balance between speed, safety, and external influences such as track temperature, weather conditions, and aerodynamics. Motivated by the switch from 13-inch to 18-inch wheels in Formula 1 – creating more space for sensors and electronics – Kistler has developed the new RoaDyn Racing wheel force transducer. This self-contained device helps teams optimize race strategies, tire management, weight distribution, tire degradation, and driving dynamics

across various race series. It is already being used in the development of the latest generation of GT3 vehicles and has been tested in Formula E since 2021 with a pre-series version.

Redefining user experience and measurement accuracy in motorsport

The RoaDyn Racing WFT is designed with maximum usability in mind, eliminating the need to connect to the vehicle's onboard system or external transmission modules that could compromise data integrity. The wheel force transducer stores data directly within the measurement device, allowing for quick and easy downloads via USB. In addition, mechanics can use a remote control to start measurement data acquisition from all four wheels simultaneously which simplifies and facilitates work processes. Synchronization with the other measured values is realized by a trigger, which can be operated in both master or slave mode. The internal power is supplied by rechargeable batteries.

At the heart of this system are four highly precise, temperature-compensated strain gauge load cells that measure forces and moments acting on the wheel of up to 20kN wheel load. These sensors provide critical data on tire loads and tire behavior. The system calculates all force and moment components within a rotating coordinate system, then seamlessly converts them into a non-rotating (fixed wheel) frame by applying the angular functions of the rotating angle. This complex process is handled in real time directly in the wheel force transducer, ensuring instant and accurate data. If required, the system also records individual forces. Precision is further guaranteed through the calibration of the sensors according to ISO 17025, using the Hexapod system from Kistler.

Forged from lightweight magnesium or aluminum alloy structural components, the device is designed for durability and has undergone extensive fatigue testing with over two million load cycles, torque resistance of up to 5,000Nm, 2,800rpm and up to 360kph. Its ring-shaped electronics provide unobstructed access to the central nut, while the independent "on the wheel" electronics simplify the installation process – enabling mechanics to install the device in less than 60 seconds. The wheel force transducer's intuitive design allows teams to handle it correctly within just two hours, thanks to its significantly reduced setup complexity. Kistler also provides detailed instructions and offers support whenever needed, ensuring a seamless user experience. Motorsport applications regularly push engineering to its limits. With RoaDyn Racing, Kistler demonstrates its commitment to innovation, enabling precise measurements even in extreme conditions.

Image material (please name the Kistler Group as picture source)

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The new RoaDyn Racing wheel force transducer from Kistler plays a key role in developing the latest GT3 vehicles. It has also proven its capabilities in Formula E since 2021 with a pre-series version.



The RoaDyn Racing wheel force transducer is equipped with four highly precise sensors that measure the moments and loads affecting the wheels. It enables motorsport teams to optimize race strategy and tire management, and significantly enhances safety for both drivers and spectators.



The RoaDyn Racing wheel force transducer streamlines wheel force performance analysis, allowing for easy installation in less than 60 seconds and rapid data acquisition while maintaining high accuracy and reliability designed for applications in motorsport testing.

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About the Kistler Group

Kistler is the global market leader for dynamic pressure, force, torque and acceleration measurement technology. Cutting-edge technologies provide the basis for Kistler's modular solutions. Customers in industry and scientific research benefit from Kistler's experience as a development partner, enabling them to optimise their products and processes so as to secure sustainable competitive edge. Unique sensor technology from this owner-managed Swiss corporation helps to shape future innovations not only in automotive development and industrial automation but also in many newly emerging sectors. Drawing on our extensive application expertise, and always with an absolute commitment to quality, Kistler plays a key part in the ongoing development of the latest megatrends. The focus is on issues such as electrified drive technology, autonomous driving, emission reduction and Industry 4.0. Some 2,200 employees at more than 60 facilities across the globe are dedicated to the development of new solutions, and they offer application-specific services at the local level. Ever since it was founded in 1959, the Kistler Group has grown hand-in-hand with its customers and in 2023, it posted sales of CHF 465 million. About 9% of this figure is reinvested in research and technology – with the aim of delivering better results for every customer.