

Press release

Peak performance in wheel measurement

Vehicle dynamics control: Kistler introduces new wheel vector sensor with even higher accuracy

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The new RV-5 version of the wheel vector sensor from Kistler captures wheel movements in five axes (steering angle, camber angle, and movements in the X, Y, and Z directions) even more accurately and with greater robustness. Thanks to innovative electronics with magnetic encoders, the sensor delivers higher quality wheel measurement, e.g. for vehicle dynamics control. It remains fully drop-in compatible with its predecessor, the RV-4.

Wheel position and orientation measurements are essential for a wide range of applications, such as verifying wheel arch and component clearance, validating simulation models for elastokinematic analysis, and developing chassis and tires. Reliable measurements that are stable and reproducible are particularly important in motorsports and vehicle dynamics control (ESC, torque vectoring, ADAS/AD) – even in the presence of dust, splash water, and strong vibrations.

Efficiently measure wheel position, steering angle, and camber angle

The new generation RV-5 wheel vector sensor from Kistler delivers such measurements with even greater robustness and accuracy. The heart of the sensor, consisting of several encoders and electronics, has been completely redesigned. Magnetic encoders replace the previous optical encoders, contributing to higher signal quality and resolution, lower noise, and more robust measurements. The RV-5 remains fully drop-in compatible with its predecessor, the RV-4: installation, operation, and interfaces remain unchanged.

Robust and stable under all driving conditions

The RV-5 connects directly to the wheel carrier structure and measures the wheel vectors at the source – without a necessary line of sight, without image processing, without dependence on surface textures or markers. Consequently, measurements remain stable and reproducible in rain, dust, splash water, or abrupt changes in light, even if the wheels are partially or completely covered by fairings and in the wheel arch. The factory calibration in the vehicle coordinate system remains stable across temperature and vibration changes; recalibrations, as required with camera-based setups, are not necessary.

At the same time, the RV-5 wheel vector sensor from Kistler is insensitive to optical artifacts and remains reliable even on rough roads, curbs, and under high lateral and vertical accelerations. The mechanical kinematics with magnetic encoders deliver consistent, high-precision, and low-latency data even where camera- and optics-based approaches reach their physical and practical limits.

Magnetic encoder: higher linearity, stability and resolution

The new magnetic encoders in the RV-5 ensure significantly better signal quality: thanks to higher linearity and stability, they deliver clean data across the entire working range – even during dynamic load changes. At the same time, they offer higher resolution, allowing even the slightest changes in angle and displacement to be captured. The lower sensor noise also results in significantly smoother raw signals that require less filtering and are available with lower latency.

The new wheel vector sensor from Kistler integrates seamlessly into existing setups: Setup is carried out as usual using the KiCenter software, so that established test procedures, scripts, and evaluations can continue to run unchanged. Mixed setups consisting of RV-5 (magnetic encoders) and RV-4 (optical encoders) are also possible. Kistler also offers service upgrades for existing RV-4 sensors, which can be converted to magnetic encoder technology.

The new RV-5 is now available in versions for passenger cars and trucks. In addition, the wheel vector sensor can be ordered separately, with evaluation electronics, or with a wheel pulse generator (WPT, which also provides the lateral wheel angle and wheel speed). Oliver Plenter, Business Development Manager at Kistler, says: “Magnetic encoders make our wheel vector sensors even more robust and precise without disrupting customers’ established setups. Plug in, configure, measure – everything as usual, but with even higher quality.”

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



Thanks to magnetic encoders, the new RV-5 wheel vector sensor from Kistler provides even more precise and robust measurements of wheel position, steering and camber angles, and other parameters.



Vehicle dynamics control: The wheel vector sensor mounted on the front wheel, combined with a RoaDyn wheel force transducer from Kistler, provides precise measurement data across all scenarios.

Media contact

Angelica Zeolla
Marketing Campaign Manager
Tel.: +41 52 2241 606
Email: angelica.zeolla@kistler.com

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 optimize their products and processes so as to secure sustainable competitive edge. Unique sensor technology from this 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 2,000 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 2024, it posted sales of mCHF 448. About 9 percent of this figure is reinvested in research and technology – with the aim of delivering innovative solutions for every customer.