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Kistler News

Vehicle Dynamics & Durability / Vehicle Safety

Kistler's flexible, user-friendly KiDAU data acquisition unit saves time and minimizes space requirements

Guaranteed Data Quality and Acquisition in Crash Tests

In 2016, Kistler is simultaneously launching two new products to handle complex measuring tasks in the vehicle safety segment: the KiDAU with an exchangeable SD panel, and the 375.XX Crash Recorder. The KiDAU data acquisition unit offers customers added flexibility because the SD panel can be exchanged quickly, and the Crash Recorder ensures data reliability thanks to the new Start-Record function. Both products share the same space-saving, user-friendly design.

Automotive manufacturing corporations are launching vehicles on the market that are increasingly complex and compact – but development cycles are becoming shorter and shorter. The percentage of electronic equipment in cars has increased over the years, and the same is also true for safety standards. In this context, crash tests using dummies play a key part in making vehicular road traffic safer, and in reducing the risk of injury to occupants. Automotive manufacturers, suppliers and test laboratories therefore need reliable measurement technologies for their crash tests.

Exchangeable Panel Unit for Maximum Flexibility

Criteria for crash tests differ from country to country, depending on legal requirements and consumer protection regulations. Tests often use a wide variety of different connector types on the sensors installed in the dummies. Different adapter cables naturally increase the risk of a deterioration in data quality – or even data loss – due to cable damage or inadequate connections. The KiDAU (Kistler Data Acquisition Unit) features an exchangeable SD (Sensor Distribution) panel – so for the first time ever, the entire connection panel can be removed and replaced with another panel: no additional adapter cables are needed. This user-friendly feature saves time, enhances flexibility, and minimizes the space required in the vehicle.

As well as a compact design (231x64x70.5 mm) and low weight (1,7 kg), this on-board data acquisition system offers more than 32 analog standard measuring channels, with 16 additional digital channels. A built-in battery can supply each device autonomously for up to 25 minutes. Maximum data storage at a sampling rate of 100 kHz is 100 s per channel. The KiDAU's WLAN functionality also offers cable-free communication for configuration, control and data readout before, during and after tests, with Kistler's "CrashDesigner" crash test control software.

> New data acquisition units with an exchangeable SD panel, and the Crash Recorder with a Start-Record function: for maximum flexibility and user-friendly operation

Each panel is assigned a unique ID number for precise documentation and quality control. The benefit: customers always know exactly where each panel is in use. Another plus: multiple KiDAUs can be connected flexibly together in series.

Crash Recorder with Start-Record Function

The trend for crash tests is moving towards direct integration of measurement technology in dummies, so as to utilize the available onboard systems for the sensor equipment installed in the vehicle. Kistler's new compact 375.XX Crash Recorder with an integrated flash data memory measures only 43x56 mm, so it can easily be mounted in a dummy – and for the first time ever, it now offers an integrated Start-Record function.

The worst-case scenario for any crash test is if the trigger (TZero event) is not activated, so no measurement data can be saved as the test is performed. Data recording in the recorder can be started at the same time as all the data acquisition systems used in the test. The captured measurement data is stored in a central memory and transmitted via system cables. The use of a flash memory guarantees non-volatile storage of crash information. The 375.XX Crash Recorder is available in 4-, 8- and 12-port versions for connection with 48, 96 or 144 channels, and is compatible with the commonly used "DTI Control" and "CrashDesigner" software packages. For more information on vehicle safety, visit: **www.kistler.com/vehicle-safety**

▸ Editorial

Dear Readers,
Growing pressure to drive innovation ahead is prompting many OEMs to benefit from the expertise of a selected development partner so they can focus more closely on their core business.

Kistler offers its customers all-round support: not only by assisting them with individual challenges, but also by providing the back-up that ensures the success of complex standardized vehicle tests. The basis: our company's many years of know-how and its range of measurement solutions for universal use. Kistler ensures consistent compliance with stringent test guidelines, thanks to modular measuring solutions and targeted developments that accommodate increasingly complex test setups.

In this issue of Kistler News, you can discover how Kistler KiRoad Performance – the mobile control unit for RoaDyn® wheel force sensors – can deliver precise wheel force measurements with the minimum of effort on configuration. Our User Report explains how Kistler's vehicle dynamics team has achieved far more accurate results than were possible with previous technologies. We also brief you on the latest product developments for vehicle safety.

I hope you'll find some stimulating ideas in this issue!

Thomas Warkentin,
Head of Strategic Business Fields
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Vehicle Safety

In This Issue

Precise Wheel Force Measurements with KiRoad Performance

Kistler's KiRoad Performance: a compact, mobile control unit that allows fast and reliable configuration of Kistler RoaDyn® wheel force transducers. WLAN support provides effortless control of the new on-board electronics via wireless.

Kistler is launching its KiRoad Performance: a user-friendly control unit for flexible wheel force measurements with smart configuration that is guaranteed adaptable to future requirements.

Functional Design
KiRoad Performance captures the digital signals from individual measuring cells connected to the wheel or hub electronics, and converts them in real time into the wheel coordinate system – including the calculations needed for the remaining force vector components. Thanks to the latest digital signal processors (DSP) with high-performance synchronous data management, the electronic unit can easily cope with each and every application situation.

Fast, Reliable Setup
When the system starts up, KiRoad Performance uploads the individual characteristic data for each of the Kistler RoaDyn® wheel force transducers. As it does this, it automatically detects which sensor is connected to which input. At the same time, settings that are already stored (such as the calibration matrix) are also updated. Dependable sensor identification and parameterization ensure maximum process reliability.

Effortless System Monitoring via WLAN
With the help of a mobile device, an ordinary browser can be used to control all the settings wirelessly via the intuitive web-based graphic user interface. In this way, KiRoad Performance and all the connected sensors can be effortlessly activated and controlled via wireless.

Learn more about KiRoad Performance at:
www.kistler.com/kiroad-performance

Benefits of KiRoad Performance

- Fast, reliable setup
- User-friendly wireless operation
- Integrated wheel database
- Synchronized signal conditioning
- Compact design
- Flexible application possibilities

KiRoad Performance delivers accurate wheel force measurements – and minimizes configuration effort

With some 1 500 employees at 56 facilities worldwide, Kistler offers you individual application-specific support at the local level

Your Flexible Partner for Standardized Vehicle Tests

Kistler supports its customers across the globe as they carry out complex standard vehicle tests. The benefits? The flexibility of additional capacity, tried-and-tested technology from one single source, and a partner who has complete mastery of the measuring chain, from start to finish.

When performing standard vehicle tests, it's essential to adhere precisely to the strict test guidelines. Braking distance, driving behavior or durability: when variables such as these have to be measured, today's test systems must not only be flexible: they also have to incorporate the latest developments in measurement technology, backed up by professional all-round support.

Standard Tests under Control – from Start to Finish
Kistler offers its customers state-of-the-art measurement solutions from one single source. OEMs, tire manufacturers and suppliers benefit from flexibility thanks to additional capacity, tried-and-tested systems, and a partner who has complete mastery of the entire measuring chain. Official guidelines state precise definitions of the physical measurands that must be recorded, and how they have to be evaluated. The criteria are strict – and this is where know-how accumulated over the years pays dividends.

One Partner for All Phases of Testing
Kistler provides support for all phases of testing: from setting the vehicle up and performing the measurements through to correct data output. State-of-the-art measuring solutions for universal use maximize process reliability and cut costs.

Kistler Standard Tests

Each Kistler vehicle test comprises several stages: vehicle setup, performance of the actual measurements, and data output in the specified format. The following tests are available at present:

- braking distance measurement, flow measurement, dynamic K&C (Kinematics and Compliance), driving maneuver
- Dynamic K&C tests (e.g. steady state circular course drive, double lane change and step steer)
- Additional tests such as braking distance, tire tests, fuel consumption, RLDA (Road Load Data Acquisition)

Vehicle Dynamics Demo with Maximum Process Efficiency

A Challenge Overcome: Efficiently Linking Large Numbers of Measurands to Deliver Convincing Results

Simply measuring the torque is often not enough to arrive at a reliable evaluation of driving and braking moment. Kistler's vehicle dynamics team has now linked large numbers of measurands together in a quickly installed test setup that nevertheless delivers high performance.

Efficiently Linking Large Numbers of Measurands
Driving and braking moments are gaining importance as factors in the precise analysis of braking behavior, and also for investigating systems with torque vectoring. In many such cases, a torque measurement on its own will not suffice – so it is even more important to link efficiently with additional measurands such as speed, location, side-slip angle, pitch and roll angle, and steering angle and moment. To achieve this goal, four RoadDyn® P106 torque wheel force transducers, an optical Correvit® S-Motion universal sensor and a KiMSW measurement steering wheel were installed in a tailor-made customer setup.

Accurate Results Call for New Analytical Methods
Within one day, the customer's test vehicle carrying this equipment delivered far more accurate measurement data than the customer expected. "The precision of the measurement data vastly exceeded our expectations. On completion of the numerous tests, the customer was delighted to report: "Now, we are about to tackle the enjoyable challenge of drawing the right conclusions from the precise measurement data at our disposal." Thanks to piezoelectric technology, users can switch over the measuring range for the torque wheel force transducers – so even the smallest moments can be detected with maximum resolution.

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