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Press release

Kistler introduces portable digital 3D force plate for biomechanical measurements

Digitalization allows a slim measurement setup for a precise gait, balance and performance analysis

Winterthur, December 2024

Kistler introduces the first portable digital 3D force plate with piezoelectric sensors for precise balance and gait analyses. Thanks to digital technology, which has already proven itself in the fixed force plate, the portable force plate allows simpler measurement setups. Compared to its analog predecessor, it requires significantly less additional hardware. Kistler has also improved the measuring range and natural frequency of the piezoelectric force plate, enabling an even more precise performance analysis in professional sports, clinical applications, and research.

Piezoelectric force plates provide athletes with valuable insights to improve their performance and support physiotherapists in treating injuries of the lower extremities. Among other things, the generated data can be used to identify uneven weight distributions after injuries or suboptimal movements. Flexible and easy handling of the measurement hardware is important to most users in everyday practice. Kistler therefore made sure to simplify the measuring chain during development so that the force plate can be used for various measuring scenarios.

The digital 3D force plate offers many advantages

The new 3D force plate with integrated charge amplifier delivers the measurement results via an Ethernet interface in a digital format. An external data acquisition system is no longer necessary. A specifically shielded hybrid cable handles both data transfer and power supply without affecting the quality of the measurement results. The digital technology also allows several force plates to be connected directly in series – a significant simplification compared to the analog version. Here, each plate had to be connected individually to an external data acquisition system.

Up to 16 force plates – twice as many as with the analog predecessor – can now be connected in a single measurement chain, for example to form a gait analysis walkway. Integrated PTP (Precision Time Protocol) synchronizes any number of force plates in the network. In addition, Kistler's DataServer interface enables users to integrate motion tracking systems and other third-party measurement systems. The force plate can be installed on a mounting frame or walkway and has

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flexible feet that can be fixed in the required position. It is available in two sizes (600x500 or 300x500 millimeters).

Precise measurement thanks to piezoelectric sensors

The piezoelectric measuring principle leads to precise results in a broad measurement range (0 to 10 kN). Four sensors, each in one corner of the force plate, measure the force with which the test subject pushes against the ground (ground reaction force, GRF) during movement. The quartz in the sensors emits small electrical charges that are proportional to the applied force while a charge amplifier integrated into the force plate makes this effect usable for data collection. The 3D force plate measures forces in all three spatial axes and reliably determines the exact center of pressure (COP). Setting up the force plate is remarkably easy as the sensitivities of the sensors are stored on the force plate and no longer have to be entered manually during recalibration.

Despite all innovations, Kistler has not forgotten about longtime users. For those who work with older models but want to benefit from the advantages of digital technology in the future, Kistler offers a retrofitting service. Users can send in their analog force plates to be upgraded with digital electronics and brought up to date.

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

The portable digital 3D force plate 9260BA from Kistler is particularly suited for a range of biomechanical measurements and mobile use, thanks to its lightweight design and easy configuration.

The digital 3D force plate is used primarily for biomechanical measurements such as gait and performance analysis.

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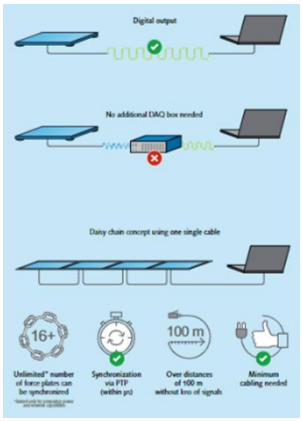

The new portable digital 3D force plate from Kistler combines the advantages of piezoelectric sensors and digital technology: up to 16 force plates can be connected in a daisy chain with minimal cabling.

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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 optimize 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.