

Press release

New digital Structural Health Monitoring system from Kistler goes live in Winterthur

Digital bridge monitoring installation now open for qualified visitors

Winterthur, August 2026

The new digital Structural Health Monitoring system (SHM) from Kistler is now in live operation on a prestressed reinforced concrete rigid-frame bridge in Winterthur, Switzerland. First presented at Intertraffic 2026, the installation shows what fully digital continuous monitoring looks like under operational conditions: microsecond synchronization across all sensors, a plug-and-play setup and minimal cabling shows a drastical reduction in installation complexity. The site is now open for individual visits, offering infrastructure professionals, bridge engineers, and asset owners the opportunity to see live bridge condition monitoring and discuss their own projects on-site.

Structural Health Monitoring has traditionally relied on centralized analog architectures with extensive cabling and complex signal chains. By digitalizing data directly at the sensor, Kistler takes a fully digital approach that improves data quality and enables real-time monitoring.

The bridge is part of an exceptional heavy load transport route. This implies that the bridge must accommodate extremely demanding loading scenarios: gross vehicle weights of up to 480 tons and axle loads reaching 30 tons are possible. This demanding environment makes it an ideal application for continuous SHM. Kistler has deployed the fully digital SHM system both as a permanent real-world SHM and as a live demonstration platform for customers and partners, capturing structural response and environmental influences under real operating conditions.

The digital sensor chain for bridge monitoring in practice: simplest installation and highest data quality

At the core of the installation is the digital sensor chain, an architecture in which signal acquisition and digitalization occur directly at each sensor. This eliminates the need for traditional, centralized data acquisition units and ensures data integrity across the entire measurement chain. Data and power travel through a single cable in a daisy-chain topology. In combination with the plug-and-play setup, this makes deployment faster, less invasive, and significantly more cost-efficient.

Every sensor in the network is synchronized at the microsecond level – a fundamental requirement for dynamic structural analysis. This enables engineers to detect subtle changes in structural behavior and identify mode shapes with confidence. Unlike analog systems, the fully digital architecture eliminates electromagnetic interference and signal degradation, ensuring consistent data quality throughout the service life of the monitoring system.

Comprehensive continuous condition monitoring – with sensor network covering all parameters

The installed sensor network covers the full range of parameters relevant to real-time bridge condition monitoring. Triaxial EasySense accelerometers (with very low noise density of $25 \mu\text{g}/\sqrt{\text{Hz}}$) capture global dynamic behavior, including bending and torsional responses under traffic and wind loads. Alongside them, triaxial UltraSense accelerometers (with an ultra-low noise floor of $0.7 \mu\text{g}/\sqrt{\text{Hz}}$) resolve low-amplitude vibrations in structurally very stiff components.

Crack meters track openings at critical locations. Triaxial inclination sensors at the supports measure rotational behavior, while strain sensors provide continuous stress evaluations from bending moments. Temperature sensors and a weather station provide the environmental context essential for accurate deformation and displacement monitoring over time.

The combination of these measurements makes the sensor network particularly powerful. By continuously and synchronously capturing structural response, environmental influences and dynamic excitation, it provides engineers with a complete, correlated dataset for meaningful structural health assessment.

Reliable, scalable Structural Health Monitoring solution featuring plug-and-play setup

All sensors are factory-preconfigured and support autoconfiguration during deployment, eliminating manual settings and reducing installation errors. In Winterthur, mounting was carried out using glued techniques, proven to be efficient and reliable for this type of structure. The SHM system also supports screw, magnetic, and welded solutions, making it adaptable to virtually any bridge type or structural configuration. Due to its modular architecture, the system can be extended or reconfigured as monitoring requirements evolve, supporting long-term predictive maintenance without replacing existing infrastructure. The result is a structural health monitoring system that is as practical to deploy in the field as it is powerful in operation.

Continuous bridge condition monitoring – live and on-site in Winterthur

The installation was realized in close collaboration with the City of Winterthur's Civil Engineering Office (Tiefbauamt) and the Head of the Civil Engineering Office Martin Joos. As a live demonstration site, the monitored bridge allows infrastructure professionals, bridge engineers and asset owners to experience a fully digital bridge health monitoring system under real operating conditions. During individually arranged site visits, Kistler experts provide insights into the installation and discuss their specific monitoring requirements. To schedule a visit or request further technical information, visit our registration page: [Digital bridge monitoring | Kistler](#).

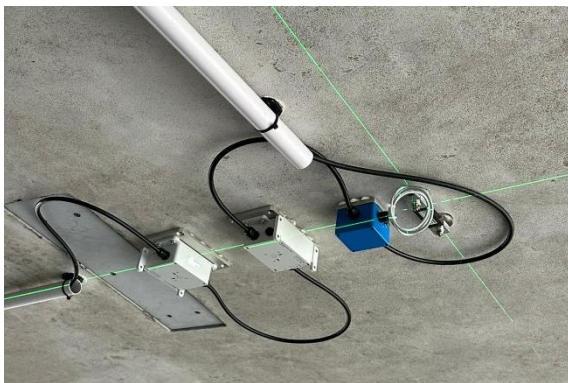
Image material (please name the Kistler Group as picture source)



The bridge in Winterthur, Switzerland, is now equipped with the fully digital Structural Health Monitoring system from Kistler for continuous real-time bridge condition monitoring under real operational conditions.



The central cabinet houses the electronics of the digital sensor chain from Kistler. It enables fully digital condition monitoring by eliminating the need for centralized data acquisition units and delivers real-time monitoring data with microsecond synchronization across all channels.



A digital sensor cluster from Kistler consists of EasySense and UltraSense accelerometers, a strain sensor, and a temperature sensor provides high-resolution deformation and displacement monitoring data for Structural Health Monitoring, all from a single measurement point.

Media contact

Kristina Palffy
Marketing Campaign Manager
Tel.: +42 12322 72655
E-Mail: kristina.palffy@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 2025, it posted sales of 424 million Swiss francs. About 9 percent of this figure is reinvested in research and technology – with the aim of delivering innovative solutions for every customer.