KISTLER

measure. analyze. innovate.

KiDAQ – data acquisition at a new level

Improved measuring certainty thanks to transparency and know-how across the entire measuring chain

Absolute Attention for tomorrow's world

Kistler develops solutions for challenges in measurement technology with a portfolio that comprises sensors, electronics, systems and services. We push the frontiers of physics in fields such as emission reduction, quality control, mobility and vehicle safety: our products deliver top performance to meet the standards of tomorrow's world, providing the ideal basis for Industry 4.0. This is how we pave the way for innovation and growth – for our customers, and with our customers.

Kistler: the byword for advances in engine monitoring, vehicle safety and vehicle dynamics. Our products deliver data that plays a key part in developing efficient vehicles for tomorrow's world.

Measurement technology from Kistler ensures top performance in sport diagnostics, traffic data acquisition, cutting force analysis and many other applications where absolutely reliable measurements are required despite extreme conditions.

By supporting all the stages in networked, digitalized production, Kistler's systems maximize process efficiency and cost-effectiveness in the smart factories of the next generation.

Editorial

KiDAQ Portable is the perfect solution for both mobile and stationary applications

KiDAQ: modular design, precise results

In research and development, every measurement task usually starts with a complex and lengthy test setup. This is due to the fact, that measurement technicians or measurement engineers first have to connect the measurement elements of different origin, before they can assemble the system. With KiDAQ, the measurement technology experts from Kistler present an innovative and integrated data acquisition system that offers all components you need for a given measurement task from a single source.

KiDAQ is a modular system that can be flexibly expanded with additional measurement modules and measurement units at any time. The advantage here is that the measurement setup can be assembled easily and quickly and users can concentrate fully on their measurements and the subsequent analysis of the acquired data.

Advantages of the KiDAQ measuring system

- Modular and flexible configuration
- Simple to operate software
- Fast and safe test set-up
- Improved confidence in measurements, because KiXact technology automatically calculates the measurement uncertainty
- Precise time synchronization across all measurement units
- Cloud-based platform enables future expansions, including those of partner companies

Reliable information about the measurement uncertainty

A key advantage of the new KiDAQ data acquisition system is our KiXact technology, which automatically calculates the measurement uncertainty. Thanks to know-how across the entire measuring chain combined with Kistler's vast application expertise, reliable statements about measurement uncertainty are now possible with this technology. That saves you the time and effort needed for a manual calculation of the measurement uncertainty, and it also helps to significantly reduce the uncertainty components in your measurement chain.

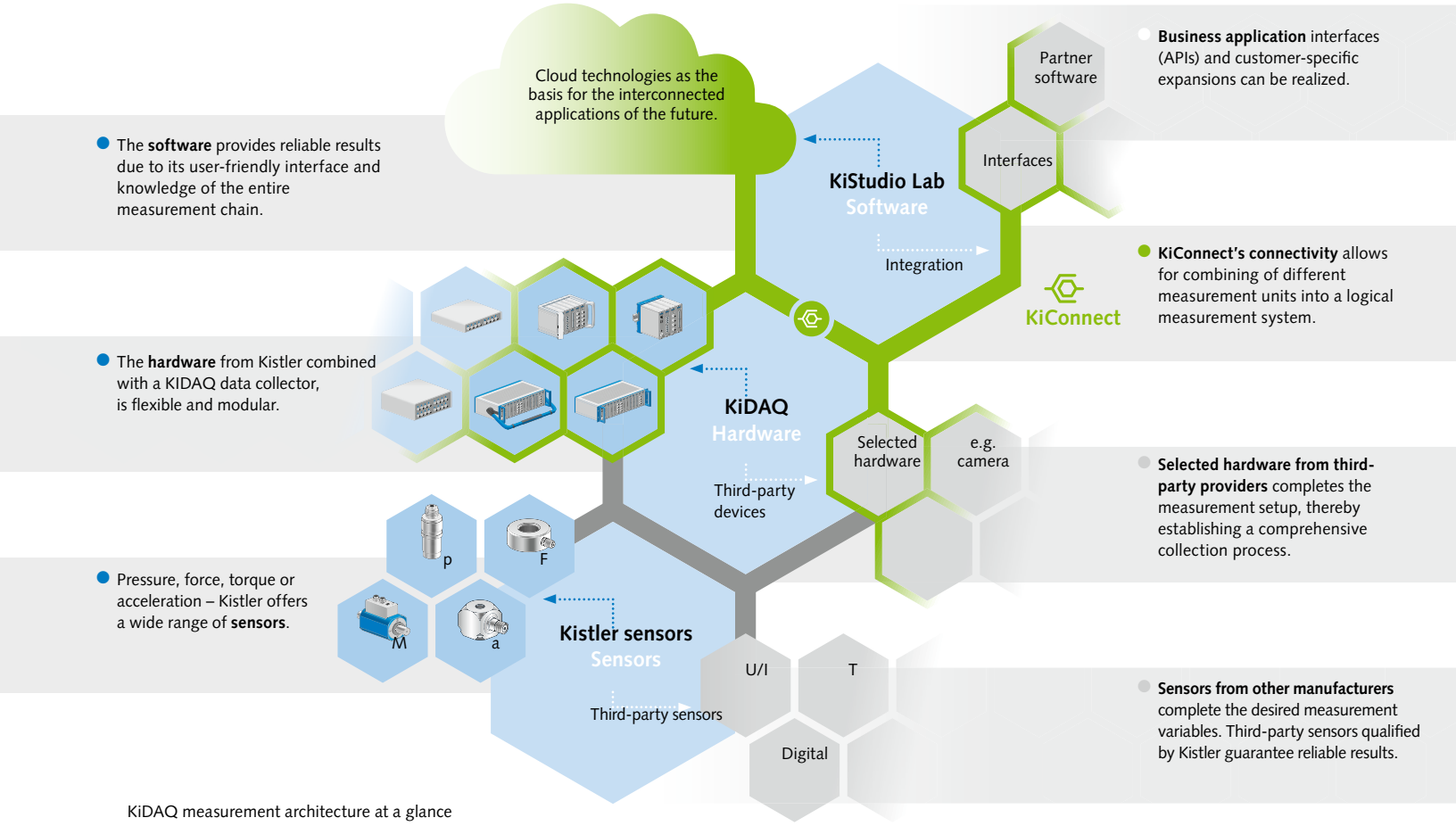
Thanks to the modular design and the various hardware models, KiDAQ can be used in a wide range of applications. Depending on the scope of the application, measurement technicians and engineers can choose from versatile designs for laboratory applications, permanent installation and for mobile use. From the range of hardware, software and sensors, select the exact components that you need for your measurement project – ensuring that you obtain the optimum data acquisition system for your specific application.

Education system
KiDAQ is the system solution for the next generation. In education – be it at a technical college, university or vocational school – students learn how to use measurement technology with a simple-to-operate system that functions with the latest cloud technologies, making it ideally suited for the future.

Research
University research and government or private testing institutes benefit from an improved understanding of the entire measuring chain, which is based on the knowledge of the measurement uncertainty. This leads to reliable results and improved measuring certainty. Kistler has filed a patent application for the procedure for determining the measurement uncertainty (see p. 10) of a measuring system.

Test and Qualification
Test service providers, certification companies and internal testing labs value the flexible range of applications and the extensive portfolio of sensors and data acquisition modules. They are able to profit from our wealth of experience, acquired through countless applications in various industries. Kistler is thus able to offer the entire measuring chain – from sensor, cable, data acquisition hardware, software and service – all from a single source.

Application fields for KiDAQ
- Aerospace
- Shipbuilding and marine technology
- Underground construction and mining
- Energy technology and environmental engineering
- Oil and gas
- Semiconductors and electronics
- Automotive engineering
- Medical technology
- University research
- Paper and cellulose
- Foods and beverages
- Chemical and pharmaceutical industries
- Mechanical engineering
- Transportation and traffic
- White goods
- Pumps and coolers



KiDAQ measurement architecture at a glance

Creating a system solution with KiDAQ

With the integrated KiDAQ data acquisition system, Kistler offers engineers, researchers, measurement technicians and students everything they need for their measurement task. Users thereby obtain a reliable solution from a single source.

Sensors

Whether for dynamic high-pressure measurements, precise force measurements or other demanding test and measurement applications: with the extensive line of pressure, force and torque sensors and accelerometers from Kistler, you obtain reliable and precise values. Sensors from other manufacturers can be connected to the KiDAQ hardware using standard connections. Third-party sensors qualified by Kistler lead to reliable results.

Hardware

With the KiDAQ data acquisition system, Kistler offers a wide selection of modules for various measurands and sensors – from simple voltage signals across measurement bridges and IEPE sensors up to charge signals emitted from piezoelectric sensors. The Portable, Rack and DIN Rail models are designed to fit various applications. Together with other high-quality signal conditioning and data acquisition systems from Kistler as well as selected devices from third-party manufacturers, the test setup can be extended on demand.

Software

Thanks to the new KiStudio Lab software, you can now configure hardware components with ease, perform measurement tasks and analyze results. Based on the latest technologies, it can be easily and intuitively operated by occasional users and experienced measurement technicians alike and establishes the basis for future networked applications.

Connectivity with KiConnect

KiConnect is the connecting element inside the KiDAQ data acquisition system. The intelligent technology allows the user to easily combine Kistler products and selected third-party devices to form a logical measurement setup and perform precise, time-synchronized measurements thanks to the Precision Time Protocol (PTP).

Business applications created with partners

In the future, the advantages of KiConnect will also be available for interested partners: innovative (startup) companies can implement their specific application know-how and ideas into a system solution, thereby benefitting from the available measurement technology and the cloud-based software platform from Kistler.

The Kistler product range comprises not only various sensors but also the corresponding signal conditioning and data acquisition systems

Measuring instruments for demanding applications

Kistler has decades of application experience with pressure, force and torque sensors and accelerometers in the most demanding measurement environments. As the world leader for dynamic measurement technology, the Swiss company offers engineers, researchers, measurement technicians and students from diverse industries reliable and precise measurement equipment.

Pressure measurement
Kistler's portfolio for pressure measurement includes piezoelectric and piezoresistive sensors. Piezoelectric pressure sensors have an extremely high natural frequency and are, therefore, used primarily in applications in which dynamic pressure changes are detected. Piezoresistive pressure sensors function largely drift free, making them predestined for static tasks.

Force measurement
Thanks to their high stiffness and natural frequency as well as the wide measurement range, piezoelectric force sensors and dynamometer are suitable for dynamic and quasi-static force measurements in the area of research and development and industrial process monitoring.

Acceleration measurement
The piezoelectric and MEMS capacitive sensors (K-Beam) from Kistler enable the measurement of extremely small accelerations, including high-frequency vibrations, under most demanding conditions. The accelerometers can be used in an array of applications and deliver reliable, reproducible results.

Torque measurement
Torque sensors from Kistler guarantee a precise definition of the power and friction coefficients of drives, gearboxes and pumps. Strain gauge technology is an excellent solution for measurements on rotating shafts as well as for dynamic and static long-term measurement.

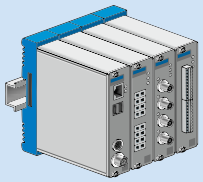
One system for every application

The KiDAQ data acquisition system has a modular design and can be flexibly expanded. Kistler offers a wide selection of measurement modules with more than 20 different measurands. The modules are available in three different case variants, thereby offering users maximum flexibility for their measuring tasks.

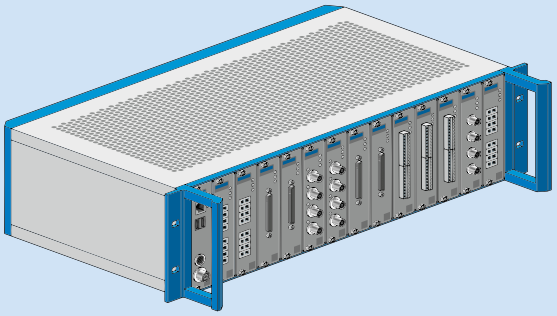
For mobile and stationary applications – KiDAQ Portable
The KiDAQ Portable measuring system is ideally suited for stationary and mobile measurement applications with a high demand on flexibility. Depending on the measuring tasks and requirements, up to 13 measurement modules can be installed in the compact and robust case. The device can also be operated by battery.

For demanding stationary applications – KiDAQ Rack
The compact and high-performance KiDAQ Rack measuring system which is based on standard 19" technology featuring three height units, was developed for permanent installation on test benches and in laboratories. The system is very well suited for extensive measurements with many measuring points and large number of channels. Up to 13 measurement modules can be flexibly installed. A modified design including handles for easier operation on the laboratory bench is available as well.

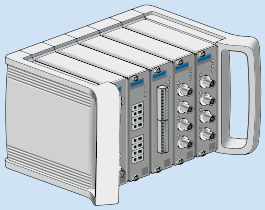
For industrial environments – KiDAQ DIN Rail
KiDAQ DIN Rail is predestined for use in industrial environments. Thanks to the standardized mechanical fastening, any number of different measurement modules can easily be integrated with the other components of the system.



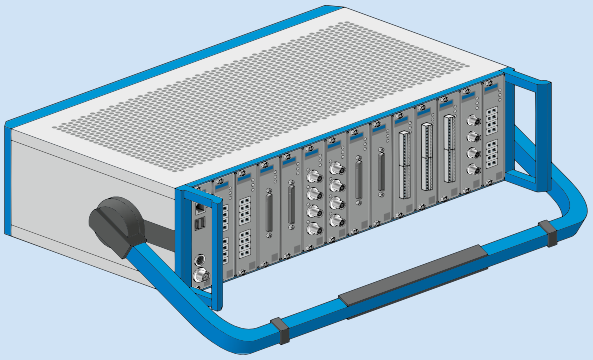
KiDAQ DIN Rail (top-hat rail)



KiDAQ Rack



KiDAQ Portable



KiDAQ Rack with carrying handle

Makes editing and managing measuring tasks easy: web-based software KiStudio Lab

KiStudio Lab: the entire measuring task at a glance

With KiStudio Lab, Kistler provides measurement technicians and engineers with a web-based software package they can use to easily edit and manage their measurement tasks and projects. The user interface was developed and designed according to the latest usability criteria, ensuring that it can be intuitively and efficiently operated by both occasional users as well as experienced measurement technicians or engineers.

Clear representation of the entire measuring chain
KiStudio Lab depicts the entire measuring chain in a clear overview. The graphs and analysis functions, which can be freely configured in the dashboard, help users quickly interpret their measurement data and, make targeted adjustments in the system or to the influencing parameters that are to be examined.

Integrated project and measurement data management
KiStudio Lab allows measurement technicians and engineers to access all measurement data and results at any time – even with regard to older projects. The raw data are easily, securely and centrally stored and can be exported into various formats and analyzed offline. In case of further measurements, the stored setup can always be recalled. Thus, instead of completing the elaborate setup first, users save time and can just proceed towards measuring on the next attempt.

Advantages of KiStudio Lab

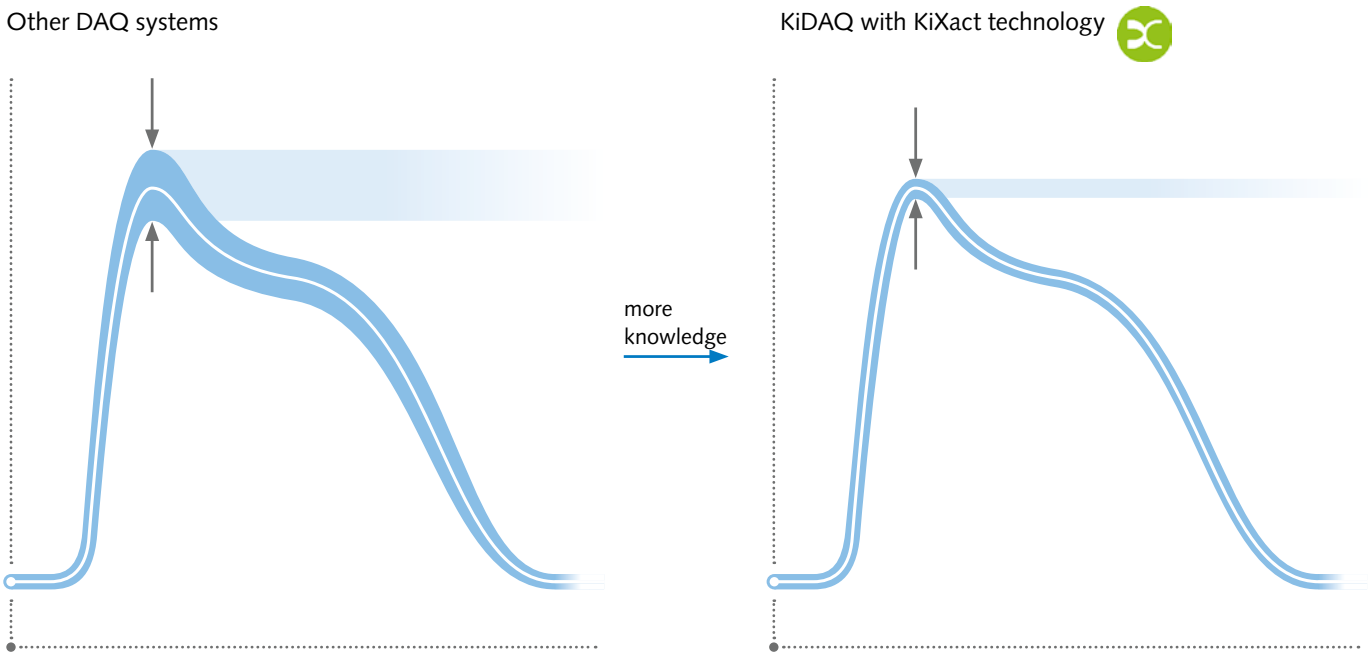
- Reach your goals more quickly thanks to simple, user-friendly operation and clear display of the entire measuring chain
- Distributed and scalable measurement setups through the use of multiple measurement units in a cohesive, logical measuring system
- More transparency thanks to automatic calculation and display of the measurement uncertainty
- Intuitive project management through simple data export for further processing with your favored tool

KiXact: the fast, simple solution for increased measurement certainty

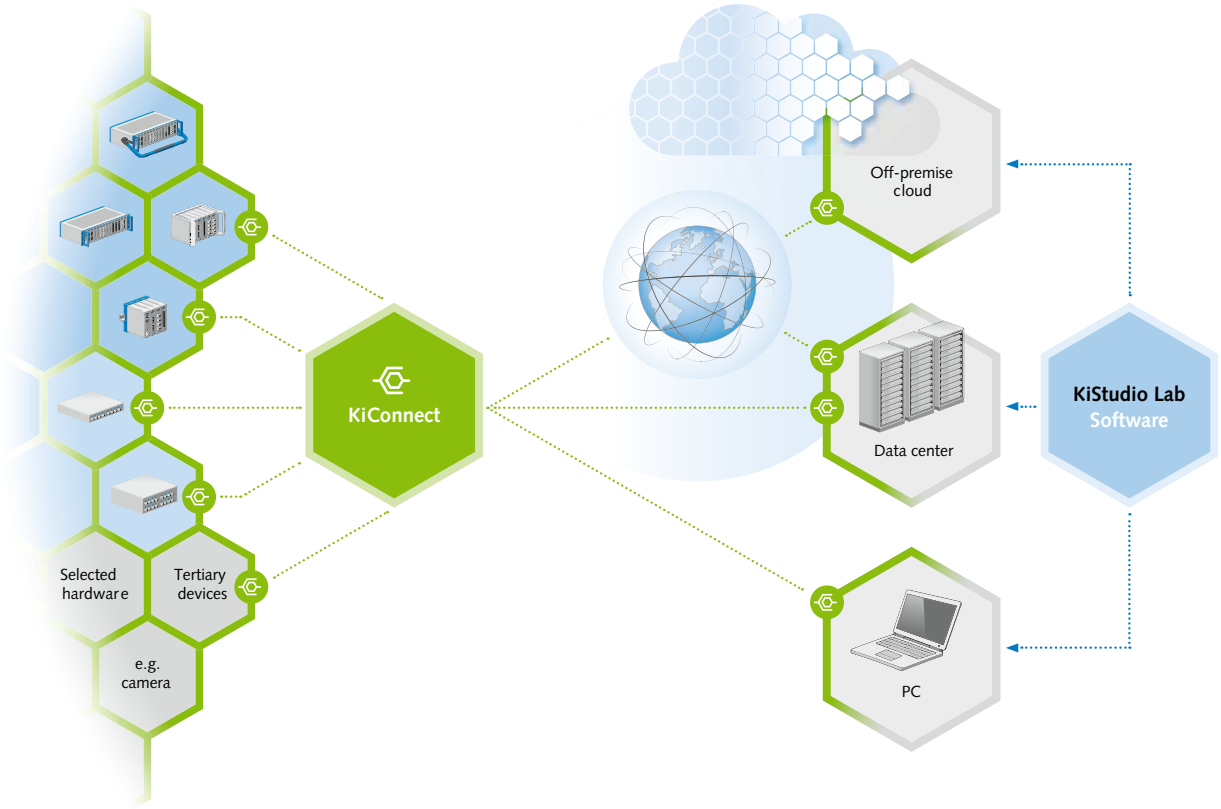
In a measuring chain, each individual component is subject to its own specific degree of measurement uncertainty which contributes to the chain's overall measurement uncertainty. Various influencing factors, such as the ambient temperature, vibrations or air humidity, act on the components and cause corresponding amounts of measurement uncertainty. The components of the measuring chain in the KiDAQ data acquisition system are qualified in the course of their development and are individually calibrated. The experts from Kistler know the properties of the individual components in the measuring chain in detail – and can provide reliable information on the measurement uncertainty. This know-how is now available to you as part of our KiXact technology.

The measurement uncertainty is an important feature within quality assurance. It provides information about how well the measurement result reflects the value of the measurand and helps assess the reliability of their measurement results. Thus, the results from various measurements are comparable with each other and with reference values, thereby providing meaningful information. A great deal of work is often necessary to determine the measurement uncertainty, since various data sheets and calibration certificates need to be referenced and numerous calculations performed.

As the leading manufacturer of piezoelectric measurement technology with decades of experience, Kistler offers extensive measurement technology and application know-how. This knowledge enables measurement technology experts to provide reliable information about the measurement uncertainty of the entire measuring chain. We share this know-how with our users by offering automatic calculation of the measurement uncertainty with the help of Kistler's KiXact technology. Once users know the measurement uncertainty percentages and magnitudes of each individual component, they can reduce the percentages by changing operating conditions or optimizing device selection and thereby benefit from a maximum level of transparency and know-how.Kistler has filed a patent for its KiXact technology.



KiXact reduces the measurement uncertainty – to give you more precise knowledge about your measurements



Connectivity through KiConnect

KiConnect – KiDAQ's nervous system

The intelligent KiConnect technology is the connecting element inside the KiDAQ data acquisition system. It allows users to flexibly and easily connect Kistler products and selected devices from other suppliers in order to assemble a logical measurement setup and to enable time-synchronized measurements thanks to the Precision Time Protocol (PTP).

KiConnect is a new technology by means of which a wide range of measurement units can be combined to form a logical measuring system. With KiConnect, not only multiple devices from Kistler can be connected to create a measurement network, but selected devices from third parties can be integrated as well. For example, cameras can be added to supply a measurement with valuable additional information.

With the integrated PTP network protocol, the exact time synchronization between devices in the local network is ensured.

Advantages of KiConnect

- Distributed, time-synchronized measurement setups
- Flexible combination of various input sources
- Maximum interoperability of the Kistler portfolio
- Integration of third-party devices is possible
- Improved usability
- Location-independent use

Accomplish measuring tasks from a remote location

KiConnect can not only be applied in the local network (for example on a PC in the so-called In-field Deployment mode). Since measurements are based on standard protocols (TCP/IP) and the web-based interface, they can also be configured and processed directly from the data center. The Cloud technologies utilized also allow for an application within the cloud – it is therefore possible to conveniently realize measuring systems at physically distant locations. Here, the IoT-technologies used ensure a quick and effortless installation.

KiDAQ measurement module overview

Measurement module type	5501A	5502A	5505A	5506A	5509A	5512A	5514A[1]	5517A
Analog input channels	2	4	8	8	4	4	8	8
Digital input channels	2	-	2	2	-	-	-	-
Sampling rate per channel (S/s)	100 k	20 k	20 k	20 k	100 k	100 k	20 k	20 k
Analog signals								
Voltage	■	■	■ till 10 V	■ till 60 V		■	■	
Voltage (isolated 1.2 kV)								
Voltage (range up to 1.2 kV)								
Current	■	■	■					
Resistance	■	■						
Potentiometer	■	■						
Pt100, Pt1000 (RTD)	■	■						
Thermocouples	■	■						
Thermocouples (isolated 1.2 kV)								
Strain gauges	■	■						■
Inductive full and half bridges								
LVDT (Displacement)								
Piezoelectric sensors					■			
IEPE sensors (Piezotron)	■					■		
MEMS capacitive sensors (K-Beam)							■	
Digital signals								
Frequency								
Pulse width								
Counter signal								
Time								
Status	■		■	■				
TEDS	■					■		

(1) Launch: December 2019 (2) Availability upon request

5518A[2]	5521A	5522A	5525A[2]	5526A[2]	5528A[2]	5529A[2]	5531A[2]	5534A	5535A[2]
2	8	4	4	4	4	4	-	-	-
4	-	-	-	-	-	-	4	8	6
20 k	100	10	20 k	100 k	100 k	100 k			
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Kistler Services: increasing success you can measure

Good service is the cornerstone in daily interactions with customers. For Kistler, however, simply good isn't good enough. We therefore provide you with an extensive service program that is tailored exactly to your needs.

Kistler Services do not end with the purchase of sensors and electronic measuring equipment. We are happy to provide you with advice regarding your measuring problem and help you select the right components. Our experienced service technicians provide on-site support to ensure that your new Kistler system is optimally integrated, connected and configured into your system. After a short introduction, you can immediately begin your measurement task.

Calibration with continuous documentation
Our calibration service provides you the security of knowing that your Kistler sensors and systems will remain fully functional over the entire operating time – the basis for precise and reliable measurement results. Every calibration is documented, without exception. On request, our measurement technology experts can also perform the calibration directly at your location. Thanks to calibration laboratories in China, USA, Japan and Germany, we can perform recalibrations quickly and uncomplicated on-site.

Custom solutions
As a system provider, Kistler supplies you with complete solutions that optimally meet your measurement needs. Our specialists are happy to design a new, tailor-made solution together with you – for even better performance in your field of application.

Kistler Services
- Guidance on how to define your measurement task and to select the components
- Start up
- Device calibration
- Repair
- Training

At our customers' service across the globe

Thanks to Kistler's global sales and service network, we are always close to our customers. Approximately 2, 000 employees at 61 locations are dedicated to the development of new measurement solutions and offer customized on-site support of individual applications.

Our representatives are here to help
Whether you would like a consultation or require support during installation – our website provides the contact information for your local representative.

Data sheets and documents
Use our Online Search to download data sheets, brochures or CAD data.

Education and training events
Education and training courses, during which our sensors and measuring systems are explained by Kistler experts, are the most efficient way for you to obtain the required user knowledge.

961-002a-09.19

Find out more about our applications:
www.kistler.com/applications

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