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Media release

The new standard for measurement in the Industry 4.0 era: digital industrial charge amplifier Type 5074A

Stuttgart, 9 October 2017 – Kistler's newly developed Type 5074A data acquisition unit breaks new ground in industrial charge amplifier technology for the Industry 4.0 era. This unit is currently the only piezoelectric sensor amplifier on the market that features communication consistently based on Industrial Ethernet (IE). For the first time, plant and machinery manufacturers can now integrate any desired piezoelectric sensors directly into a real time-capable Ethernet system, so they can easily make settings on the measurement amplifier via the control.

It's increasingly clear that industrial production is switching over from analog to digital systems. This is because data communication is becoming more and more complex in response to requirements for optimized processes. As we move towards Industry 4.0, older bus systems such as Profibus and CANbus are gradually reaching their performance limits – and at the same time, Industrial Ethernet appears to be gaining ground as the global communication standard. For every customer who wants to be at the forefront of these fast-moving developments, Kistler now offers an entirely new kind of solution for piezoelectric measurement data acquisition: the Type 5074A charge amplifier.

This innovative product is an ideal choice for monitoring and optimizing industrial press-fit, assembly and joining processes, among many others. It can be regarded as a digital version of the tried-and-tested Type 5073A analog charge amplifier. Complete digitization means that the new unit enables direct communication up to amplifier level. The 5074A features an exceptionally wide range of measuring functions, making it the perfect solution for all applications that call for dynamic and quasi-static measurements via Industrial Ethernet.

The Type 5074A charge amplifier – flexible measuring ranges, performance and functions
With the new 5074A, up to four piezoelectric sensors per unit can be connected to the digital industrial network. The charge amplifier is available with the EtherCAT, Ethernet/IP and ProfiNet communication protocols, so it covers the main Industrial Ethernet standards. This gives users a major advantage: right away, they can conveniently set up and view all parameters via the control. This guarantees control of datasets – with no need to install additional software. Another benefit: each channel can be individually controlled. Direct access to the status of the unit and the measuring channels ensures that measurement processes are highly reliable at all times. While operation is in progress, the control receives confirmations of status changes: for instance, whether the unit is in 'measuring' status or whether the measuring range has been exceeded. With the 5074A, the raw analog signal from the sensor is already digitized in the amplifier – so the disturbance variables that occur in conventional analog systems can be avoided from the outset by inductive or capacitive couplings. Likewise, complex and costly cabling for analog and control signals is eliminated. This amplifier fully supports the latest Industrial Ethernet standards, so it can deliver fast and precise measurements at up to 10,000 bus cycles per second – making it particularly suitable for time-critical control processes. Thanks to an oversampling option that allows generation of multiple measuring points per cycle, the 5074A is also an ideal solution for high-resolution acquisition of processes with up to 50,000 measurement values per channel and second. Customers themselves can limit the process data to the functions they require so as to optimize network capacity utilization and increase the control's performance capability.

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Stefan Affeltranger, Product Manager for Production Monitoring at Kistler, sees the 5074A as an utterly convincing example of the company's innovative strength: 'The 5074A is the world's only amplifier for quasi-static measurement processes with piezoelectric sensors that offers communication based on real time-capable Industrial Ethernet. Measurements can now be adapted even more specifically to our customers' widely varying needs thanks to a long list of new features: convenient settings via the control, a variable process map, an exceptionally wide measurement range and bandwidth with adjustable low-pass filters, and the switchable high-pass filter that is integrated into the hardware. In a nutshell: this new unit delivers extraordinary flexibility to cope with virtually any industrial application.' Data security is another plus, as Stefan Affeltranger explains: 'Access to the unit is only possible with the appropriate industrial communication protocol, and changes to measurement parameters can only be made with access via the master.'

Given the flexibility and functional scope that this unit offers, customers will find that its costs are highly attractive – especially as compared to analog signal paths. That's because fewer components are needed to implement the hardware, while configuration and programming are restricted to the programming environment that is already familiar to the user.

Illustration 1, a

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Illustration 1, b

Illustration 2

Illustration 1, a and b: Kistler's digital industrial charge amplifier (Type 5074A) is the world's only amplifier for quasi-static measurement processes with piezoelectric sensors on real time-capable industrial Ethernet. It allows direct integration of any desired sensors with charge signals, and settings on the measurement amplifier can be made via the machine control.

Illustration 2: Kistler's new Type 5074A charge amplifier allows up to four sensors per unit to be connected. Each measurement channel can be individually configured and controlled. What's more, this unit covers the main Ethernet standards – EtherCAT, Ethernet/IP and ProfiNet. This means that all parameters and measurement data can be set and called up directly via the machine control.

About the Kistler Group
Kistler, the originator of piezoelectric measuring technology, is the global leader in dynamic pressure, force, torque and acceleration measurement. Cutting-edge technologies provide the basis for Kistler's modular systems and services.

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Customers in industry, research and development benefit from Kistler's experience as a development partner, enabling them to optimize their products and processes so as to secure sustainable competitive edge. This owner-managed Swiss corporation plays a key part in the evolution of automobile production and industrial automation, and its innovative sensor technology also helps foster the development of many newly emerging sectors. Drawing on our extensive application expertise, and always with an absolute commitment to quality, Kistler drives innovations ahead in lightweight construction, vehicle safety, emission reduction and Industry 4.0.

Over 1,850 employees at 61 facilities across the globe are dedicated to the development of new measurement solutions, and they offer individual application-specific support at the local level. Ever since it was founded in 1959, the Kistler Group has grown hand-in-hand with its customers and in 2016, it posted sales of CHF 364 million. About 10% of this figure is reinvested in innovation and research – with the aim of delivering better results for every customer.

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