

INDUSTRIAL ENGINEERING NEWS

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Mass Flow Controllers with 20+ Gas Select Function

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Flow Meters



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14 Miniature force washers for reliable shear-force monitoring



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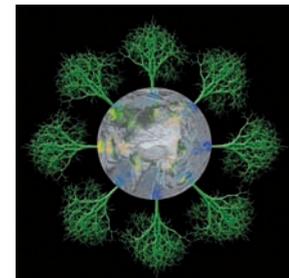
Dear Reader,

Hannover Messe (April 23-27) is getting closer and closer! In our March preview we are presenting all major new developments of the exhibition: first, for the sixth time in a row, Industry 4.0 will be the main focus, with the tagline "Integrated Industry - Connect and Collaborate". The goal is to show not only the developments in production and factory automation, which were impressive over the last edition of the show, but also to give the full picture and discover new areas: boundaries that existed are vanishing in smart factories. Furthermore, for the first time this year, **CeMAT**, the World leading trade fair for Intralogistics and Supply Chain Management will be held in parallel with Hannover Messe: Logistics 4.0 meeting Industry 4.0.



You already had the possibility to read the interview with Marc Siemering, Senior Vice President - Industry, Energy & Logistics of Deutsche Messe AG in our Jan/Feb issue, and now on page 8 you can read a preview to the show. Plus, the April issue of **IEN Europe** will be completely dedicated to Hannover Messe. Are you exhibiting there? Do not hesitate to contact us for promoting your presence!

Energy Efficiency & Renewable Energy and **Industry 4.0** are the other two focuses of this issue: from page 10 to 13 and from page 16 to 19, you will find interesting articles, product news, case histories and application stories related to these two main trends. Energy efficiency is key to ensuring a safe, reliable, affordable and sustainable energy system, building for the future, in combination with the always innovative concepts of Industry 4.0.



Last, but not least, an **exclusive interview** with Mark Pontin, Managing Director at Resolve Optics. The company has recently reached an important goal... check it out on page 22!

As announced in the last issue of our magazine, take your time and visit of our website, www.ien.eu, boasting a modernized look and optimized visibility on mobile devices.

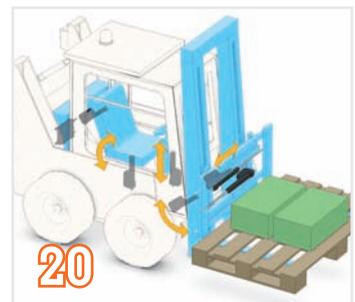
Marco Marangoni

TIMGlobal Media Associate Publisher

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Annual Result 2017: Strong, Profitable Growth for Bühler

2017 was a successful year for the Bühler Group. Bühler organically increased its order intake by 10% to CHF 2.8 billion, its turnover by 9% to CHF 2.7 billion, and its EBIT by 18% to CHF 205 million. As of year-end, its order backlog amounted to CHF 1.7 billion (+9%). These results mirror Bühler's positioning as a provider of integrated process solutions for sustainable mobility and healthy food. The same also applies for the acquisition of the Austrian Haas Group, which now allows Bühler to also occupy a leading position in the consumer foods market. Both Bühler businesses contributed to this strong growth. Grains & Food increased its order intake and turnover by 7% to CHF 2.1 billion and CHF 2.0 billion, respectively. Advanced Materials boosted its order intake by 21% to CHF 672 million and its turnover by 19% to CHF 640 million. Growth was also strong in the service business and the business for single machines, which together now account for 32% of total turnover. Market share gains were achieved in particular by milling, feed, optical sorting, aluminum die casting, and optical coatings.



Elesa at MACH Exhibition, Birmingham

The extensive Elesa range of standard machine elements is designed around the needs of manufacturing in all industry sectors, many of which will be on display at the 2018 MACH Exhibition, taking place on 9th - 13th April at NEC Birmingham. Featured on the Elesa stand - Hall 6, No. 72 - will be their IP65-7 direct dial digital position indicators with electronic mechanism for easy set up and readout. These are coupled with the Elesa wireless spindle positioning system which enables faster and more reliable machine set up by use of a wireless connected profile controller, which displays the initial set up values on each of up to 36 electronic position indicators. The operator can simply choose the appropriate menu then quickly re-set each spindle to its correct start position and the machine is "good to go". This saves time and takes out much of the possibility of human error. The Elesa LMHD hygienic levelling feet (EHEDG certified) for use in bio-hazard areas such as food processing or other hygiene sensitive areas, feature mounting holes which provide rugged adjustable equipment mounting and facilitate reduced cleaning work - which can be up to 25% of the production time. Thus



leaving more time available for production, with less use of resources such as fresh water, energy and cleaning agents.

A solid year for Endress+Hauser



In its preliminary financial figures for 2017, Endress+Hauser reported a broadly supported growth in sales, solid profitability and a marked increase in employment. The company is a leading global provider of process and laboratory measurement engineering, automation solutions and services. The Group's consolidated net sales rose 4.8 percent to 2.2 billion euros. Exchange rate impacts prevented the company from generating even better numbers for the year. "Expressed in local currencies, we grew more than six percent in 2017," emphasized Chief Financial Officer Dr. Luc Schultheiss. "The consumer-driven economic boom has now reached the capital goods industry as well," said Matthias Altendorf, CEO of the Group. Higher demand for the company's products and services spurred a significant increase in new hires, especially in production. Endress+Hauser had 13,299 employees at the end of 2017, an increase of 296 over the prior year. Following another upswing in the business during the fourth quarter, the measurement technology specialist entered the new year with a sizeable rise in backlog orders. For 2018, the family company expects to see growth in the mid-single-digit percent range. The audited financial figures for 2017 will be presented on 8 May 2018 in Basel.

Positive Revenue Development in 2017 for Schaeffler

Global automotive and industrial supplier Schaeffler announced preliminary key figures for 2017. The company confirmed the 5.9 percent increase in revenue at constant currency previously announced on January 15, 2018, which exceeded the company's guidance for 2017 of 4 - 5 percent. Total revenue rose to 14.0 billion euros in 2017. Fourth quarter revenue increased to approximately 3.5 billion euros. This represents constant currency revenue growth of 8.5 percent for the fourth quarter of 2017. Both company's divisions contributed to this positive revenue development in 2017. While the Automotive division reported revenue growth of 5.9 percent at constant currency, the Industrial division's constant currency growth rate amounted to 5.7 percent. In the fourth quarter, the Industrial division grew by 9.1 percent at constant currency, exceeding the Automotive division's growth. Automotive OEM business order intake showed a promising trend: It reached 11.5 billion euros for the full year, representing a "book-to-bill ratio", the ratio of order intake to revenue, of 1.3x.



Take your factory with you



Remote access for absolute control

Mitsubishi Electric's GOT2000 is the seamless gateway to your entire factory. Featuring intuitive smart device-like gestures and multi-touch commands, the human machine interface (HMI) of this graphic operation terminal streamlines monitoring and control of industrial automation devices. In addition, integrated wireless LAN communications both empowers you with system design flexibility and supports remote access to HMI and connected equipment for easy maintenance and training. Mitsubishi Electric Factory Automation solutions put virtually every type of factory automation device and application at your fingertips.





Quality management and digitalisation in manual assembly operations

At SPS IPC Drives 2017, Mitsubishi Electric's Guided Operator solutions for manual assembly applications demonstrated how improvements in quality and productivity can be achieved. These solutions also enable the seamless transfer of production data from manual assembly operations to higher-level enterprise systems, supporting the digital transformation within manufacturing.

Mitsubishi Electric's solutions are already being used by leading automotive OEMs to aid with quality control in manual assembly processes and efficient stock handling. Similarly, customers are using the solutions for assembly operations in the semiconductor industry to optimise product quality management. Among the many other areas of interest are life sciences and medical device assembly applications.

Giving the operator a clear visual indication of which parts to pick and in what sequence, the Guided Operator Solutions help to improve quality. This is especially important for today's assembly operations that are becoming increasingly complex.

▶▶ 54660 at www.ien.eu



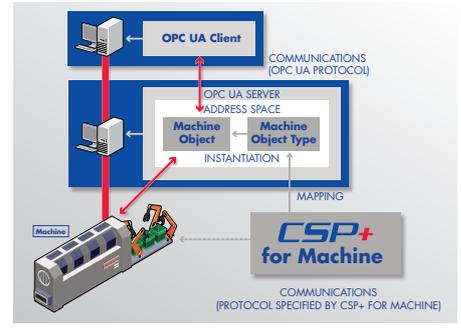
Mitsubishi Electric's Smart Condition Monitoring solution wins 2017 Food Processing Award

Mitsubishi Electric has gained further recognition for the innovative Smart Condition Monitoring (SCM) solution, winning the Continuous Improvement category at the 2017 Food Processing Awards.

The SCM was developed to provide a simple, easy to implement solution for predictive maintenance, offering the tools businesses need to bring an end to costly, unscheduled downtime. The SCM is built around smart sensors, physically attached to the assets in question and transmitting feedback information to an advanced controller, incorporating a Mitsubishi Electric PLC.

The individual sensors provide an in-built traffic light warning indication at the machine, while also transferring the data over Ethernet to the smart sensor controller for in-depth monitoring and analysis. The crucial data analysis is performed on the PLC, so the system can be relied upon to transmit simple accurate overviews or warnings to operators in real-time prior to significant asset failure.

▶▶ 54661 at www.ien.eu



CLPA announces OPC UA companion specification for new "CSP+ for Machine" technology

The CC-Link Partner Association (CLPA), in association with the OPC Foundation, announced an OPC UA companion specification for the CLPA's new "CSP+ for Machine" technology, to further ease the implementation of Industry 4.0 type applications, at SPS IPC Drives 2017.

CSP+ for Machine is an extension of the CLPA's existing "CSP+" (Control & Communication System Profile) that provides easy network configuration and maintenance by offering profiles that describe each device on a CC-Link IE or CC-Link network. CSP+ technology has been established for some time and provides easy drag and drop network configuration from CSP+ files provided by CLPA partner vendors, allowing convenient device libraries to be created. This new announcement takes the technology one step further by allowing whole machines to be treated in the same way. Complex systems can now be dealt with as if they are a single device, reducing complexity significantly and greatly simplifying the task of obtaining vital process data.

▶▶ 54662 at www.ien.eu

New widescreen interfaces offer enhanced machine handling

Mitsubishi Electric has expanded its GOT2000 series of Human-Machine Interfaces (HMI) with two new widescreen versions. The ability to display additional visual information gives users of the new GT21 and GT25 widescreen HMIs the opportunity to enhance machine operability and the potential to increase productivity. Other valuable features include two separate Ethernet ports and a built-in sound output interface that can be used for spoken alerts or information.

Mitsubishi Electric's European Product Manager for the GOT range, André Hartkopf says: "Humans like looking at things in widescreen, the extra area is readily usable, and the ability to display much more visual information on the screen along with audio is a key enabler to drive up productivity."

The GT21 is a 7" widescreen Graphic Operation Terminal (GOT) offering WVGA resolution and featuring on-board Ethernet, CC-Link IE Field Basic, RS-232 and RS-422/485 connectivity options. The GT25 is available in both 7" WVGA and 10" WXGA and adds a second Ethernet port for increased flexibility, as well as supporting wireless LAN connectivity. The second Ethernet port on the GT25 model enables users to physically separate the connections to the information system network and the control system network. The ability to set different IP addresses for each network helps to promote increased security and safety, and increases network flexibility.

The GT25 also offers a sound output interface, with built-in speaker and amplifier. This enables the HMI not only to emit audible alarm or alert sounds, but also to play spoken alert messages or operator instructions. Reinforcing the information displayed on the screen, spoken operator instructions can be a key aid in boosting productivity.



Along with all of the standard functions of the existing GT21 and GT25 range, the new GOT2000 widescreen HMIs offer remote monitoring capabilities with the VNC server function. By remotely connecting to the GOT from a personal computer or tablet, users can monitor and operate production equipment and connect to system devices. Additional functions on both new GOT models include GOT Drive, enabling start-up, adjustment and maintenance of servo systems directly through the GOT. Stylish and compact, with a narrow bezel, both new GOT models witness the trend for future Mitsubishi Electric operator panels.

▶▶ 54663 at www.ien.eu

Meeting Place for Integrated Industry



From 23rd to 27th of April Hannover will host the two world leading fairs for Industry, Intralogistics and Supply Chain Management

For the sixth time in a row Hannover Fair will take place with a clear focus on the developments of Industry 4.0 with the claim "Integrated Industry - Connect and Collaborate". The goal is to show not only the developments in production and factory automation, which were impressive over the last editions of the show, but also to give the full picture and discover new areas, because boundaries that existed are vanishing in smart factories.

This is the reason that for the first time this year CeMAT, the world leading trade fair for Intralogistics and Supply Chain Management will be held parallel with Hannover Messe: Logistics 4.0 meeting Industry 4.0. CeMAT exhibitors will show all the areas of logistics from forklifts and trucks to fully automated handling and control systems, logistics IT and robotic logistics and packaging solutions. A lot of potential links to production as you can see to

streamline processes and boost efficiency and flexibility in the factory.

But there are also news and changes in the focuses of Hannover Messe itself. For the first time the IAMD (Integrated Automation, Motion and Drives) will take place, merging the Industrial Automation and Motion, Drives & Automation setup from former years, reflecting on markets growing together and having faster innovation cycles. IAMD will cover the broad field of industrial automation, industrial IT, power transmission, and fluid power technology - from mechanical engineering and robotics to process automation. An important part will be the combination of machine learning, IT platforms and integrated robots for the industry. One the one hand this leads to increasing autonomy of machines and robots in production but also offers new opportunities of collaboration between man and machine in



smart production. To show you the full range of opportunities from established robot manufacturer to start ups are showing their ideas and expertise.

For the software part that plays an important role and will be crucial for further developments, halls 6 to 8 will host the Digital Factory. Integrating data from all processes of the value chain is the deciding factor in gaining the competitive edge in the manufacturing industry today. Digital Factory will show IT solutions that enable the exchange of data between development, production, and distribution. The trade fair also showcases software from virtual product development to production planning and control and predictive analysis. And it explores concepts that enable the secure distribution of mass data in digital factories.

Partner Country of the Hannover Messe 2018 will be Mexico, for the first time a Spanish speaking Latin American country. Traditionally, economically aligned to its northern neighbor the USA, the country goes to a transition that leads to a global orientation and a focus on smart modern production processes. The participation of around 160 Mexican companies and organizations to Hannover Fair gives the opportunity to connect in a direct way that is analogue but never old fashioned.

We will be happy to see you in Hannover at our Stand in Hall 9 Stand H81 to receive your feedback and suggestions. See you soon!



MULTI-COMPONENT SOFTWARE SYSTEM

Builds and analyzes databases of power quality



Electrotek Concepts announced its new PQView 4 software that provides utilities with a platform to track and identify abnormal power quality events. PQView 4 offers the most advanced approach to fault detection and characterization

of power quality anomalies on the utility's distribution system. PQView® is a multi-component software system that builds and analyzes databases of power quality and energy measurements. It stores and quickly analyzes large quantities of power quality disturbance and steady state measurement data from thousands of utility end points.

►► 54639 at www.ien.eu

3D MANUFACTURING

Fast and scalable process



Xaar technology and inkjet are transforming 3D Printing from a prototype industry to volume production. Inkjet technology is ideally placed to deliver 3D Printing's transformation to volume manufacturing, exploring the benefits and growth of 3D Printing in general, and the key enablers to accelerate the industry's growth. Moreover, digital inkjet, and specifically Xaar's TF Technology and High Laydown Technology, is at the heart of the solution, delivering both a fast and a scalable 3D manufacturing process which is robust as well as economical. 3D Printing as a manufacturing methodology encompasses a range of processes and applications all focusing on building parts up, usually layer by layer. It is a highly attractive methodology, not just because it eliminates the need for tooling, but also because it provides superior geometric freedom, giving product designers much more capability, whilst substantially reducing product design and production lead time.

►► 54641 at www.ien.eu

COTS SINGLE BOARD COMPUTERS

For use in Power and Cost-constrained systems



Kontron announced the VM6103, a new 6U VME SBC with NXP Layerscape scalable multi-core 64-bit ARM processor. The low power dissipation blade computer features more than 4600DMIPS

while drawing less than 10W. The Kontron VM6103 is ideal for use in Size Weight, Power and Cost (SWaP-C)-constrained systems and general-purpose missions, ranging from industrial to extreme rugged transportation and defense applications. The VM6103 is available with either a 2-core 1GHz or a 4-core 1.6GHz 64-bit ARM A53 Layerscape processor, on-board soldered DDR4 (with ECC), as well as up to 64GB on-board soldered Flash optionally.

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Prolonging the life of motors and gearboxes

By analysing vibration data, Schaeffler has been able to detect damage to components such as rolling bearings and gears early, therefore eliminating costly, unplanned downtime and prolonging the devices' life

Schaeffler UK is providing regular patrol monitoring and vibration analysis services to a UK-based energy-from-waste (Efw) facility. By analysing the vibration data from a range of critical plant and equipment at the site, Schaeffler is able to detect damage to components such as rolling bearings and gears early, therefore eliminating any costly, unplanned downtime and prolonging the life of motors and gearboxes that drive a variety of critical fans, conveyors and pumps. Since 2012, as part of its annual service contract with the customer, Schaeffler UK has been providing regular on-site vibration monitoring and analysis services to the Efw facility. The site generates electricity by burning hundreds of thousands of tonnes of household and commercial waste each year.

Vibration measurements

During each visit, a Schaeffler field service engineer takes vibration measurements on 60-70 items of equipment to identify any deterioration of rolling bearings and other general mechanical components on a variety of critical plant and equipment at the site. This equipment includes electric motors, gearboxes, large primary, secondary and induced draft air fans, conveyors and pumps. This equipment is located on separate lines that feed separate furnaces at the site. Any unforeseen downtime to these lines would be costly, resulting in 'lost' production.

FAG Detector III

Vibration measurements are made and stored using Schaeffler's FAG Detector III handheld

vibration monitoring device. With its free of charge software, 'Trendline', which includes a database of more than 20,000 different bearing products from different suppliers, this device enables the user to collect, store and analyse vibration measurement data. Used in combination with the data viewer, the bearing database is ideal for assessing a machine's condition. The FAG Detector III is used to measure and record vibration data at each selected measurement position on the patrol monitoring route. The three basic measuring parameters are velocity, acceleration and enveloped acceleration. The measurement data is then analysed by the Schaeffler field service engineer, who then writes an analysis report and recommended action list for the maintenance team at the site. The report typically includes Acceleration and/or Velocity Trend plots that show pre- and main alarm limits and how the vibration data has varied over time.

Report and recommendation

After analysing the recorded vibration data using the FAG Detector III's Trendline software, Schaeffler was able to report on all the items of equipment and to recommend any repairs or remedial action that is required. If bearing wear is found to be the cause of high vibration levels on a gearbox, for example, this can be reported to the customer, who can then source the appropriate bearings and plan precisely when the maintenance work i.e. replacing the defect bearings can be carried out without disrupting the rest of the facility.



The FAG Detector III handheld vibration monitoring device is used to measure and record vibration data at each selected measurement position on critical plant and equipment at the Efw facility



The FAG Detector III is used to measure and record vibration data from rolling bearings, gears and other rotating mechanical systems at the site

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WASTEWATER SUBMERSIBLE PUMPS

Drain highly contaminated liquids



Conrad Business Supplies offers various models of the Extrema submersible wastewater pump from T.I.P. (Technische Industrie Produkte). All pumps feature a robust stainless-steel motor housing, a water-cooled motor and self-lubricating precision ball bearings, as well as thermal overload protection. These pumps can be used to pump liquids with temperatures of up to 50°C in continuous operation. It is also possible to pump liquids up to 95°C for up to four minutes. The

precision cast wheels of the Extrema series are made of high quality cast iron or stainless steel (AISI 304). The Vortex free-flow impeller efficiently prevents clogging of the pump, as dirt particles being swirled and crushed. Therefore, large particles of dirt do not cause a problem. Application areas of the pumps are MRO (maintenance, repair and operation), building protection as well as drainage. The pumps are suitable for pumping or the recirculation of even heavily contaminated liquids as well as for emergency drainage. The Extreme 300/10 Pro, Extrema 400/11 Pro, and Extrema 500/13 Pro models differ in motor performance, delivery head, and flow rate.

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PYROMETERS WITH FIBRE OPTICS

Used in crystal growing factories for the solar industry



DIAS pyrometers of series 10,40 or 44 are used for the measurement of the melting temperature. The suitable devices of series 40 and 44 are the types PYROSPOT DS 40N and DS 44N that are short-wave spectral pyrometers in the

measurement range between 800 °C and 2500 °C. Depending on the type of system, ratio pyrometers of type PYROSPOT DSR 10N can be used as well. Besides the devices of the series 44 and 10 provide the advantage of a bus-compatible interface for the simplified integration in existing control systems. Crystals, which are drawn up from a melt in a so-called crystal growing system, are needed to produce wafers in solar industry. The crystal growth from a melt is activated by the slow cooling of the melt that crystallizes thereby. It is important to measure the temperature of the melt in this process, but also the temperature of the heating elements that control the process. Both has to be coordinated to guarantee an optimal crystal growth. Pyrometers with fibre optics and small optical head are preferred used for the measurement of the heating temperature because the space available is limited. These pyrometers of type PYROSPOT DSF 40N and DSF 44N provide a measurement range between 600 °C and 1800 °C for example and small optical heads with only 12 mm aperture.

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VACUUM TECHNOLOGIES

For increased efficiency, durability and higher effectivity



Leybold presents its vacuum technologies for the food processing and packaging industry. The efficient solutions of the vacuum supplier are used worldwide. In a wide variety of applications, the pumps, systems and measuring

devices make a significant contribution to sustainable and competitive products and processes. At one of Italy's largest producers of meat products near Parma, the installation of a Leybold system has reduced packaging time by around 20 percent. In addition to high vacuum performance, the meat product specialist attaches particular importance to an energy-efficient production process with low service and maintenance costs. The system based on the DRYVAC dry screw pump has been running reliably and without interruption for years, so that the customer was able to devote himself to the core tasks. Efficient, hygienic food processing under vacuum is also becoming increasingly important for other reasons: in the age of global supply chains, the demands on shelf life are increasing. In view of this trend, customized vacuum solutions are essential for the economic efficiency of companies. For decades, Leybold has been manufacturing the technologies for the quality control of packaging.

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FUS



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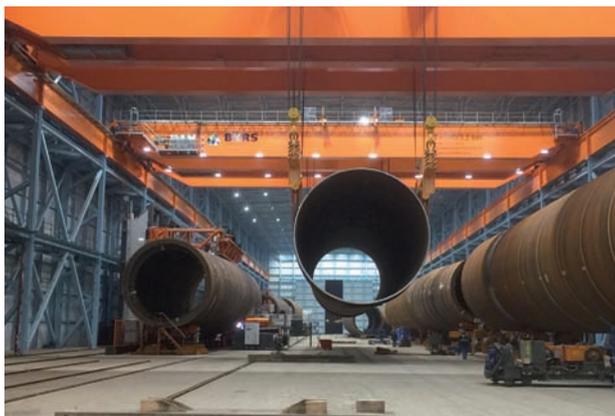


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Frequency Drives in Seaworthy XXL Foundations

Yaskawa U1000 compact frequency drives have been used for the precise control of four 250 tonne cranes, in foundations for offshore wind turbines and gas and oil platforms

BKRS Crane Systems, the Dutch builder of overhead cranes, has collaborated on a new production facility for the continuous production of seaworthy XXL foundations for offshore platforms. These foundations are manoeuvred in the production hall using specially constructed overhead cranes. Of the six cranes delivered, four can be operated simultaneously in order to lift and move more than 1000 tonnes in a controlled fashion. Precise control of these heavy and extremely long loads was made possible through the application of Yaskawa U1000 frequency drives.



Production facility in Rotterdam

On the grounds of the Dutch Maasvlakte II port in Rotterdam a new production facility has been built for the continuous production of seaworthy XXL foundations for offshore wind turbines and gas and oil platforms. These foundations, with diameters of nine metres or more, are hoisted aboard offshore ships directly from the assembly and coating facility. They are manoeuvred using four special 250 tonne overhead cranes, produced by BKRS Crane Systems in Veghel, the Netherlands. Each crane has two Demag hoisting units, each with a nominal capacity of 125 tonnes. In the hall measuring over 500 m long and 20 m high, the cranes, powered via a power supply rail, are controlled radiographically from the ground. The cranes are powered with 400 V three phase 1200 A (maximum 830 KVe). The four separate 250 tonne cranes can be controlled independently but can also be linked, enabling one man to manoeuvre the extremely long loads of more than 1000 tonnes with precision using four cranes simultaneously. The two

remaining cranes have the same construction as the other four cranes but are calibrated for 80 tonnes. Due to the heavy loads the customer requires high levels of quality of the construction of the cranes. The construction meets Execution Class 3 with annual inspection, which means that it has to satisfy the same requirements as, for example, submarines or nuclear installations.

Controlled movements

For the exact command of these enormous loads during hoisting and transport, high demands are made on the motor control and crane process. BKRS Crane Systems has used Yaskawa frequency drives for many years already. The frequency drives from Yaskawa are perfect for heavy hoist-load control applications. In this project the new Matrix converter U1000 was chosen, characterised by its compact form and the absence of a DC bus. Thanks to the U1000 drives, highly efficient AC-AC direct conversion of the braking power to the mains net is possible. Due to this, the large amount of brake resistance normally necessary in order to process the braking energy is no longer needed. Due to spe-

cial software installed in the drive, an extremely precise control of the load is possible; during movement and braking the XXL load cannot be allowed to sway or rock, an important requirement from the customer. The Matrix drives are the newest generation of regenerative frequency drives in the extensive range of drives from Yaskawa and fit perfectly into the 'Green' crane aspect that limits its CO2 emissions. Beside its compact form it also has a high output and the standard U1000 satisfies the strictest international

standards for the Power Factor. There is a global trend regarding the laws relating to harmonics and power factor; the Yaskawa U1000 already complies with IEEE519.

Switch-boxes

In this specific project certain demands were made on the maximum height of the switch-boxes. These were not allowed to be higher than the hoist. Demands were also made on the quality of the switch-boxes; whilst loading the foundations onto ships they are exposed to salt-containing open air. The switch-boxes and frequency drives were provided with high-grade lacquer and double seals for this reason. BKRS Crane Systems made detailed designs of the switch-boxes and engineered and built them themselves. Furthermore, braking resistance was to be avoided. Due to the compact dimensions and minimal internal heat generation of the U1000 frequency drives, creative engineering and specially built cabinets BKRS Crane Systems could easily meet all the requirements.

►► 54624 at www.ien.eu



ROLLER AND BALL BEARINGS

Exhibit higher dynamic load ratings



Of direct relevance to the wind energy sector, DNV GL has confirmed that roller and ball bearings made of NSK's Super-TF material exhibit significantly higher dynamic load ratings. Such is the effect of the higher load rating that bearing service life is effectively doubled in wind turbine applications. The rolling

bearings of wind energy systems have to attain very long service life under harsh operating conditions. To overcome this challenge, NSK set about developing its Super-Tough (Super-TF) bearing steel, a proprietary material for very high load applications. Looking to gain independent certification for the material, NSK commissioned the world-renowned test house DNV GL to verify rolling bearings made of Super-TF with respect to ISO 281:2001 (Rolling bearings - Dynamic load ratings and Rating life). The verification confirmed NSK's published specifications and, in a Statement of Conformity dated 15.11.2017, certified that when Super-TF material is used, the basic dynamic load rating can be improved by 23% in roller bearings and 26% in ball bearings. This is equivalent to a doubling of bearing fatigue life in comparison with ordinary bearings.

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BUCK-BOOST CONVERTER

Provides 1.3x longer battery life



ROHM announces the development of a buck-boost DC/DC converter with built-in MOSFET featuring the lowest current consumption in the industry, making it ideal for electronic devices powered by batteries such as electronic

dictionaries, remote controls for home appliances, and items such as toys, and other portable electronic devices. ROHM applied power processes and analog circuit technologies cultivated over many years to develop power supply ICs that meet market needs. This includes this latest converter optimized for devices powered by single use batteries. The BU33UV7NUX outputs the 3.3V necessary for driving MCUs in applications requiring 1-3V input from 1 to 2 batteries. Pursuing lower current consumption in order to prolong operating time in battery-equipped devices allowed ROHM to achieve an industry-low current consumption of 7µA (vs functionally equivalent products). This can extend the operating time by as much as 175 days compared to conventional products, from 540 days to 715 days (ROHM study, 50uA load current and assuming standby operation in conventional remote controls driven by 2 alkaline batteries). In addition, a load current mode switching function is built in that allows existing remote controls to support the latest high-performance systems equipped with LCD panels.

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SMALL PRESSURE TRANSMITTER

High precision in smallest possible design



With the ATM.mini, the Swiss precision specialist **STS** is now launching a new pocket-sized measuring instrument that offers engineers certainty with regard to the accuracy of their data. The ATM.mini reliably mea-

sures pressures up to 100 bar with a precision of 0.5 percent total error across a temperature range from -40 to 125 ° Celsius. The ATM.mini offers this precision even in complex long-term tests thanks to the optional "burn-in" method: Using this procedure, STS eliminates the slight stress that are produced by the sensor's mechanics right from the factory to achieve excellent long-term stability. The durable stainless-steel case and the overpressure resistance ensure durability even under harsh conditions. Since the weight of a measuring instrument itself can have an impact on the measured data, it often has to be adjusted retroactively. Weighing only 50 grams, the ATM.mini is a real lightweight that eliminates this extra effort. The small outer dimensions of 17,5 x 49 mm allow the pressure transmitter to be easily mounted on small or winding components. A variety of available pressure and electrical connections offer users flexibility. Regarding the output signal, customers can choose whether the measured values are transmitted via a current signal (mA) or a voltage signal (VDC).

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COMPACT LOW-COST OSCILLOSCOPE

Upgradable bandwidth via software licence



The new **Rohde & Schwarz** RTC1000 oscilloscope series features the highest instrument integration in its compact form factor. The instrument's comprehensive features are tailored to meet the needs of users in the field of education, engineers with low budgets and hobbyists. The compact oscilloscope can double as an

eight-channel logic analyzer, a four-channel pattern generator and a protocol analyzer for I2C, SPI, UART/RS-232, CAN and LIN; and as a digital voltmeter, component tester, spectrum analyzer and counter. With this eight-in-one instrument integration, users get more value with a minimal footprint on bench space. R&S RTC1000 oscilloscopes are available in models from 50 MHz to 300 MHz. They are the first in the 1000 class to offer bandwidth upgrades via software license all the way to 300 MHz bandwidth; these upgrades can be purchased as test needs increase over time. The two-channel oscilloscopes have maximum sample rates of 2 Gsample/s and a memory depth of 2 Msample. All R&S RTC1000 models come as standard with LAN and USB interfaces. The combination of eight other products all in a single compact instrument has been very well received by early test customers.

►► 54651 at www.ien.eu

MINIATURE FORCE WASHER

Reliable shear-force monitoring in machining processes



HBM has introduced its new PACEline CSW miniature force washers for reliable shear-force monitoring. The new piezoelectric sensors' typical fields of application include force monitoring tasks in machining processes such as cutting,

milling, and turning. Additionally, the CLP miniature sensors enable a swift upgrade of the force washer to a sensor with multiple axes. The PACEline CSW piezoelectric shear-force washers have a very low height, ranging between 3 and 5 mm. Once the sensors are mounted and calibrated, they can measure shear force in the direction of the cable reliably. The CSW force washers take up extremely little space due to their low height and they have the same dimensions as the type PACEline CLP force washers (for normal force measurement). Combining them with the CLP force washers and using at least two CSW force washers mounted in different directions enables measurement systems to be set up to measure force in different directions simultaneously and, at the same time, take up only very little space. The PACEline CSW series force washers have a fixed cable; they are made from stainless steel materials, and comply with the IP65 degree of protection. The PACEline CSW is available with maximum capacities ranging from 1 kN to 8 kN.

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SAFE MAGNETIC ENCODER SYSTEM

Long-distance measurement with high accuracy



The new **Balluff** magnetic encoder system BML-S1G SIL2 was designed especially for safety applications. It is TÜV Rheinland certified and features both an analog and a safe absolute SSI or BISS-C interface. Thanks to its long measuring range of 48 meters and high repeat accuracy (< 1 µm) the system is ideal for many

different applications. It supports the functions "safe incremental value" and "safe absolute value". The sensor can be used in safety applications up to Safety Integrity Level 2 (SIL 2) per EN 61800-5-2/ EN 62061 / IEC 61508 and Performance Level d (PL d) per EN ISO 13849-1. The system is the ideal choice for long measuring lengths as well as for applications that require high precision. With an accuracy of up to ± 20µm the system meets these requirements at an attractive price/performance ratio. No absolute interface cards or new controller hardware are necessary. If the system is used together with the BML Configuration Tool, many additional parameter and diagnostics functions such as condition monitoring are available. This tool not only allows BML system parameters to be simply visualized and modified, but also enables you to read operating conditions and display them graphically in real time.

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INDUSTRIAL DUTY LINEAR POSITION SENSOR

Contactless measurement for versatile applications



The **Sensor Connection** has expanded its sensor product offering by adding a line of ILPS-27 Series Inductive Linear Position Sensors using LVIT Technology; contactless devices designed for factory automation and a variety of industrial or commercial applications such

as motor sport vehicles, automotive testing, solar cell positioners, wind turbine prop pitch and brake position, and packaging equipment. The contactless operation prevents wear out from dither or cycling. With their compact design, superior performance, and excellent stroke-to-length ratio, ILPS-27 sensors are ideal for both industrial testing laboratories and OEM applications. The 27 mm (1.05 inch) diameter anodized aluminum housing is sealed to IP 67. 10 ranges from 50 to 450 mm (2 to 18 inches) are available. Operating from a variety of DC voltages, the series offer a choice of four analog outputs and all include TSC's proprietary SenSet™ field recalibration feature. Radial cable exit versions with swivel rod eye ends or axial termination versions with either M-12 connector or cable can be delivered. The ILPS series also includes the ILPS-19 series for applications where a shorter length and smaller diameter body is required and the spring loaded ILPS-18S for applications where the probe cannot be hard fixed to the measurand.

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ABSOLUTE IO-LINK ENCODER

Intelligent diagnostics for higher reliability



SICK presents its all-new AHS36/AHM36 singleturn and multiturn absolute encoders with IO-Link interfaces. The IO-Link interface allows the encoders to be seamlessly integrated into a variety of high-level networks. They can also be configured using the IO-Link master or SOPAS Engineering Tool. This variant makes even more options available for obtaining measurement data and monitoring motion. Features, such as

intelligent diagnostic functions, allow the AHS/AHM36 family of absolute encoders to evaluate maintenance intervals for the entire system, increasing system reliability and setting new standards in flexibility and diagnostics. The singleturn/multiturn resolution, counting direction, and other parameters can be individually adjusted when the encoders are integrated with different networks. The encoder also communicates diagnostic data such as temperature or operating time. The encoder family's generous operating temperature range of -40 °C to +85 °C and protection class of up to IP67 means the encoders can even be used in the harshest ambient conditions. The singleturn variant of this rugged, reliable, fully magnetic sensor system offers a maximum resolution of 14 bits and 26 bits for the multiturn variant.

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TRANSDUCER FOR ELECTRICAL NETWORKS

Measuring power in demanding applications



The DM5S transducer is the latest addition to **Camille Bauer Metrawatt's** large product portfolio. Just like the predecessor model the main function is highly accurate representation of the basic parameters of an electrical network. It then transmits this representation securely via analogue outputs or a digital interface. The basic accuracy of the DM5 is 0.15% for current and voltage, 0.2% for power ratings and 0.5S for energy

counters. The highlights of the new series are its many selectable options and the fact that measurement values are captured continuously (zero-blind measurement). In addition, the device can be individually configured even without being connected to auxiliary power. The optimised and compact design not only saves space, but also reduces cost. DM5S supports up to 32 counters with up to 16 tariffs, while the DM5F delivers very high processing speeds of up to 15 ms. This makes it easy to implement even the most demanding applications such as turbine control systems. The free "CB Manager" software is not just used to set up the device parameters, it also provides utility functions to support the user to get started, such as printing product identification labels, checking connections and recording measurement values.

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HIGH-RESOLUTION PYROMETERS

With rugged remote sensor head



Fluke Process Instruments expands the Endurance pyrometer series by models with a remote sensing head that tolerates ambient temperatures up to 315 °C.

This design is ideal for applications with tight space constraints and for mounting near a heat source and in harsh environments. The sensing heads also offer improved immunity to electromagnetic interference. They are connected to a rugged IP65 electronics box via fiber-optic cable.

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Sensors for the Internet of Things

Low power pressure sensors for wireless monitoring and evaluation

The Internet of Things (IoT) always starts with a sensor. After all, things cannot capture states or carry out actions unless they are fitted with sensors. These two activities and a connection to the web are what make these objects “intelligent” without the help of humans. KELLER AG für Druckmesstechnik is one of Europe’s leading manufacturer of pressure sensors, making it a key partner when it comes to implementing IoT solutions.

IoT is already a widely known and to some extent controversial term. Yet, the Internet of Things is all around us every day, whether we realise it or not. If, for example, you can control TV recordings or your lights at home using your smartphone, this falls under the category of the “smart home”. If a company uses automatic, independent processes in its organisational measures, we call this a “smart factory” or “Industry 4.0”. Other related terms include “smart energy”, “smart mobility” and “smart health”.

No matter the sector, the sensor is ultimately the most important supplier of data and thus the key component of the IoT process. When fitted to an object, different sensors can be connected to local and global communication networks. The final step in the process is to analyse the data on networked computers or in a cloud. IoT processes are highly customised and are undergoing continuous development. KELLER has already worked with international companies to develop numerous “smart”, customer-specific total solutions in various sectors and applications.

Alongside water and drinks, fuels are another liquid ideally suited to being managed by means of automated, “smart” processes. The remote monitoring of fuel levels in heating oil, diesel, and petrol tanks is a great support to mineral oil companies, petrol station owners, and property managers alike. KELLER developed the “EasyOil®” remote monitoring system in



GSM-3 remote transmitter with external power supply, ATEX safety barrier and pressure transmitter level sensors (from top down)

partnership with a Swiss mineral oil supplier. This system has really found its place in the market and is the key selling point for customers in 80% of the contracts concluded for heating oil deliveries.

The order process is managed through tank monitoring: The pressure and level of oil are measured at the lowest point in the tank, the current content in litres is calculated according to the shape of the tank and the data is transmitted via GSM. A special feature of this application is the customer-specific software. In addition to the current data such as fill level, consumption and order history, it also contains oil prices, which are updated twice a day. This combined information optimises the order process, allowing customers to stockpile when the price of oil is low or the tanker is close by. Because there is a risk at petrol stations that an electric spark could cause the gaseous atmosphere to explode, any pressure transmitter taking measurements in this type of environment must be intrinsically safe. For this application, the GSM-3 remote transmitter has been extended to include a box with built-in safety barriers that limit the electric output of the measurement system within the zone at risk of explosion (the ex zone), thus preventing sparks.



►► 54631 at www.ien.eu

PROGRAMMABLE SAFETY MODULES

Free development and programming software



Pizzato Elettrica GEMNIS series modules are programmable safety devices, which allow several safety functions to be carried out simultaneously. The redundant design and the self-monitoring of these multi-functional devices allow a high safety level of up to SIL3 acc. to EN 62061, category 4 and PLe

acc. to EN ISO 13849-1 to be achieved. Every module is equipped with an integrated USB port via which programming and debugging can be performed with GEMNIS Studio. GEMNIS Studio, a software designed and developed entirely by Pizzato Elettrica, is a graphic development environment for the creation, simulation and debugging of programs that are uploaded to the corresponding modules of the GEMNIS family. The "Desktop" was created with this objective in mind. It allows the user to intuitively view the behaviour of the project currently being developed as well as all actions that the application program will execute after being loaded in the module. GEMNIS Studio allows you to carry out monitoring and detection operations, and to graphically represent the state of an active operational device in real time. The installation package for GEMNIS Studio can be downloaded free of charge from www.gemnis.com.

►► 54632 at www.ien.eu

PLATFORM FOR INDUSTRY 4.0

Analyze processes - identify bottlenecks



Clouver, the Industry 4.0 platform from **Procom** targets both machine manufacturers and producers, who wish to offer their customers surplus value and to assure their future sustainability through developing their industry 4.0

adaptability. Clouver interlinks production with its digital image, creating transparency at all levels of your company. Enabling you to analyse production processes, identify hidden production costs and bottlenecks in advance. The service of machines and the optimization of running production is made significantly easier. During the process Clouver collects specific technical as well as economic data in real time merging it with other applications of customers and compacting it with other relevant data; at any moment in the process each one involved will receive custom-fit information specific to a field of work. Clouver offers local storage of data as well as the opportunity to file and analyse selected cloud-based data through its edge-option. In this way Clouver-users may at any time determine who can access which data when and to which degree of detail. Enabling Clouver-users to further their own production processes or those of their clients, to offer added value, to develop cloud-based business models yet guaranteeing maximum data security at the same time.

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LOW-POWER, WATERPROOF MEMS SENSOR

For accurate pressure and temperature reads



The InvenSense ICP-10100 single-axis pressure sensor, available from **Mouser**, achieves the industry leading pressure noise of 0.4 Pa RMS and power consumption of 1.3 μ A at 1 Hz. The tiny MEMS sensor measures extremely small pressure differences of ± 1 Pa, which enables

the device to detect altitude changes of less than 5 cm. The sensor offers a full pressure operating range of 30 to 110 kPa and ensures excellent temperature stability with a temperature coefficient of ± 0.5 Pa per degree Celsius. The pressure sensor has an embedded temperature sensor and 400 kHz I2C bus for communication. In addition to the device's low-power mode of 1.3 μ A at a noise of 3.2 Pa, the ICP-10100 features a low-noise mode of 0.8 Pa while only consuming 5.2 μ A for high-performance applications. The small 2 mm \times 2 mm \times 0.72 mm device includes an IPX8-rated housing, making it waterproof to a depth of 1.5 m for up to 30 minutes. For evaluation, the sensor is supported by the DK-10100 SmartMotion Platform Development Kit. The kit is based on a Microchip G55 microcontroller and comes with necessary software, including InvenSense MotionLink, a GUI-based development tool, and embedded Motion Drivers (eMD) for ICP-10100. The DK-10100 includes an onboard embedded debugger.

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How "smart plastics" reduce costs and prevent production losses

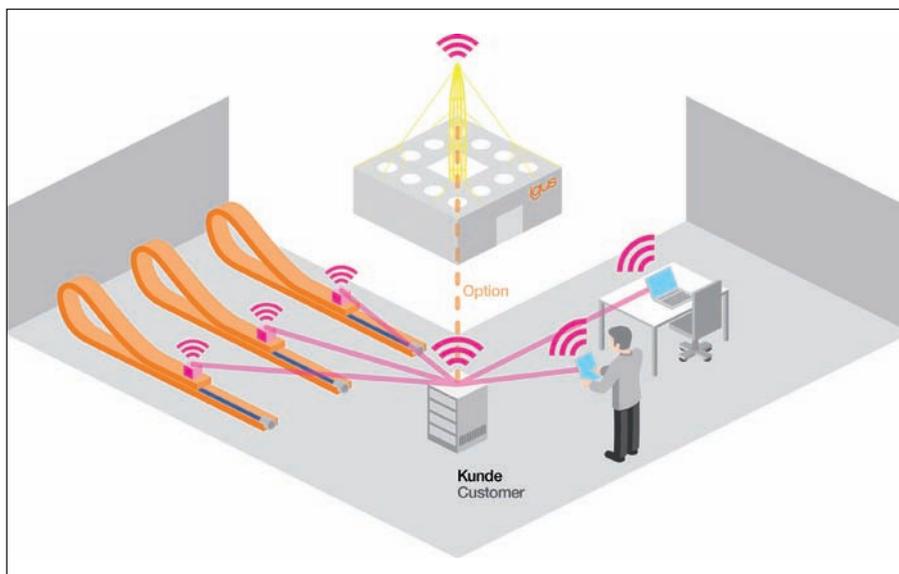
Predictive maintenance is part of Industry 4.0 and the factory of tomorrow. For this sector, igus has developed a family of products under the name 'isense', where various sensors and monitoring modules make the plastic components of energy chains, cables and plain bearing products intelligent

The smart plastics help to avoid unplanned plant downtimes and thus expensive production losses. "Thanks to the digital networking of machines and products, it is possible to continuously record the condition of the components and to inform as soon as a repair or replacement is required," explains Michael Bläß, authorised officer e-chain systems at igus. In energy chain systems this is, for example, the isense EC.M sensor, which is mounted on the moving end of the chain and automatically records acceleration, speed, temperature and the number of cycles completed. The distance travelled and the remaining service life of the system can then be derived from this information. With the optimised isense EC.W sensor, the wear on the wear pads is determined to the nearest percent in sliding e-chain applications on cranes, linear robots or travel axes.

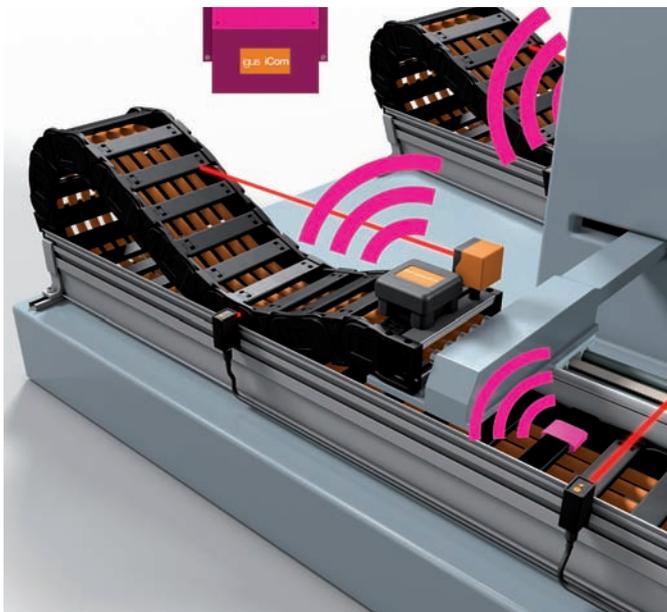
Immediate stop during incidents

The company igus has developed the isense EC.B module for immediate and unpredictable incidents. It determines the breakage of a chain link due to accidents or deliberate destruction. The module consists of a polymer wire in special separators and a sensor unit. The information from the sensor unit can either be read out by the evaluation unit isense EC.B, which may be part of the IoT network, or the sensor unit is connected directly

to the customer's system. Among other things, this system is used by an Austrian automotive supplier in their indoor linear robot for the automated handling of engine blocks. Here, in the past, there were no complaints to be detected in the visual monitoring of the energy chain systems, but the chain failed two weeks later. This can then be prevented by the break monitoring. Since 2010, the so-called PPDS (Push/Pull Force Detection System) has been used worldwide on hundreds of crane systems to detect unusual operating conditions. A force sensor attached to the moving end of the e-chain continuously measures the resulting tensile and shear forces during operation and balances them with the saved set points. In the event of a fault, an immediate shutdown of the system takes place, depending on the settings made by the customer, before further major damage to the e-chain system occurs. The proven PPDS concept has now been integrated into the isense concept under the name isense EC.P. In addition, the modules can be integrated wirelessly via WLAN or wired (CAN bus) and thus also help to improve the preventive maintenance recommendations. For energy chains and in particular in guide troughs on long travels, isense EC.RC (e-chain run control) provides reliable protection against rising in the event of a blockage. Sensors measure and check the position of the energy chain. In this way, the machine is prevented from



Through isense the smart e-chain, cable and linear guide communicate with the customer and inform them about their condition and potential maintenance dates. Optionally isense can be connected to the igus data centre to automate and optimise maintenance processes



The isense EC.RC uses different sensors to carry out measurements and check that the energy chain is functioning correctly. A single communication module can monitor many e-chains and cables simultaneously. (Source: igus GmbH)

continuing to operate or the chain from rising when mechanical faults occur; meaning that total loss of the chain or an electrical shutdown (for example, due to cable damage) are a thing of the past.

With the new isense CF.Q top-hat rail module even chainflex cables, which were developed by igus specifically for the moving application in energy chains, become "intelligent". Based on the experience of thousands of tests in the world's largest laboratory for dynamic cables spread over a floor area of 2,750 m², they advise the customer before the changes in the electrical properties lead to a plant shutdown. Due to continuous measurement of the electrical properties, ambient temperature and the number of cycles, a possible failure of the cable is predicted in good time. Continuous testing in the test laboratory and in customer applications help to make analysis of the measured values increasingly more precise.

Intelligent plain bearing technology

There are members of the isense family also in the plain bearing technology division, the second largest business area of igus. With the isense PRT.W module and the isense DL.W module, the abrasion and thus the remaining service life can be measured on iglidur PRT polymer slewing ring bearings or drylin linear guides. The status data are passed on via wireless to the user, who is able to intervene at the right time from anywhere. As lightweight and robust plastic elements, these modules are also suitable for easy retrofitting and a variety of applications. For example, particularly in packaging technology, but also in assembly automation, automobile factories or in the manufacture of electronic articles.

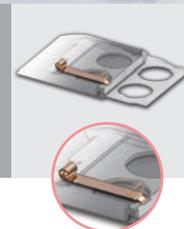
Collecting and evaluating machine data

In Industry 4.0 networks, isense products can send all collected data anonymously to a central igus data store via an iCom data concentrator. The advanced iCom module now communicates extensively without wiring. It is even easier to integrate into existing production, one of the reasons being that only a single iCom module is needed for several systems. In addition, customers can optionally connect status-monitoring, data-generating units of other manufacturers to the iCom module. From these data, the igus Machine Learning models calculate a wear prediction that takes into account the actual usage patterns. The precision of

the maintenance recommendations presented via a web interface is thus continuously improved. The plant operator can then make use of planned production stoppages to implement precise preventive maintenance recommendations and thereby optimise their business processes. In this way, the maintenance and service costs can be further reduced and the quality of the production enhanced. The collection and analysis of machine data is in the process an important cornerstone for a higher planning reliability and efficient maintenance in the factory of the future. Comparable to a global test laboratory, the analysis and evaluation of concrete data from a wide range of applications allows the identification of numerous statistical values which, on the one hand, make more precise predictions possible and on the other, could also be integrated into the research and development of new products

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Emergence of Smart Actuators Signals towards Maintenance 4.0

How smart electromechanical devices are reshaping the plant floor and associated maintenance functions according to Thomson Industries, Inc.

Industrial devices are becoming increasingly intelligent and connected, promising new capabilities for plant control and greater cost savings. These benefits will extend to the maintenance function as intelligent devices require less upkeep while also being better able to interact with asset management systems for condition monitoring and predictive maintenance. A closer look at recent developments with smart electromechanical shows how devices such as these are reshaping the plant floor and associated maintenance functions.

The emergence of smart actuators

In many plants, moving parts such as actuators are the most critical devices on the floor. They control vital functions such as valve movement in continuous process plants and conveyor adjustments in batch production plants. The

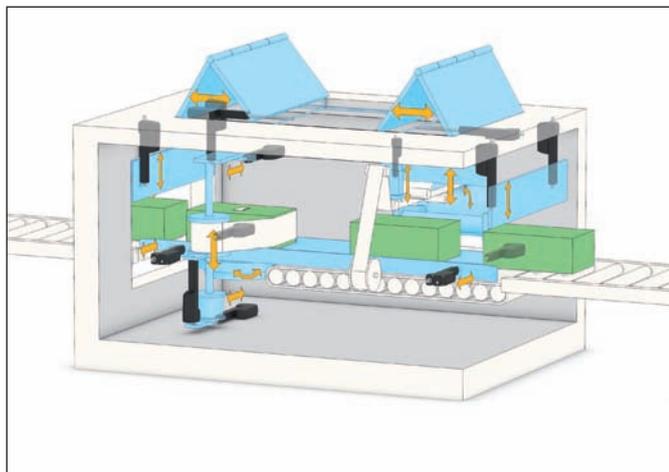
first generation of actuators developed simply converts either pneumatic or fluid power into motion. These actuators provide high-speed stroking at high volumes, but have limited precision and other drawbacks as well. Pneumatic actuators, for example, require a continuous supply of air, which is not cost-efficient for automation of intermittent operations. Hydraulic fluid-powered actuators are more energy efficient, but have higher maintenance demands with the potential fluid leakage. And neither pneumatic or hydraulic actuators can participate easily in control schemes.

Increasingly, machine designers are choosing to replace pneumatic- and fluid-powered actuators with electromechanical actuators, which provide more energy efficient and cleaner operation. These electric actuators can provide both high-speed and high-pre-

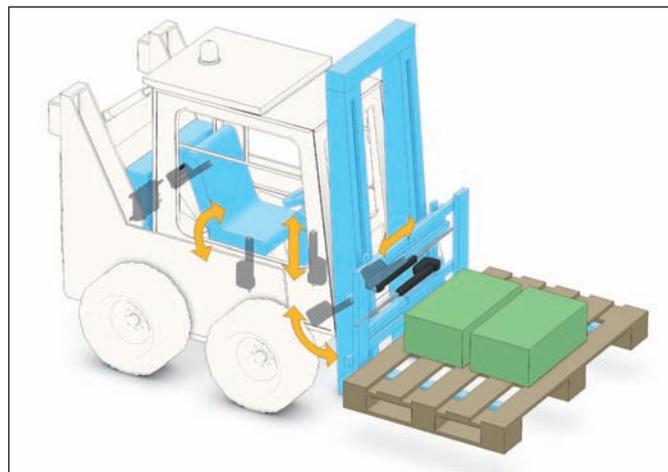
cision performance, but legacy models have not been cost effective for automating intermittent activity. End users have preferred to perform intermittent tasks such as adjusting conveyor belts for product changeover manually rather than pay a significantly higher cost for capital equipment.

Why smart actuators are flourishing

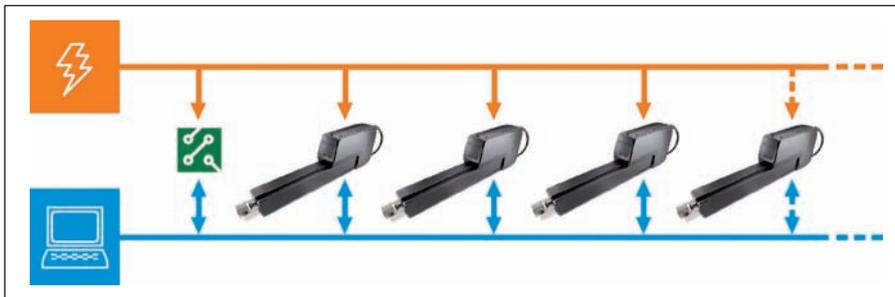
By integrating smart actuators into their equipment, machine designers give end users the ability to switch motor direction within the actuator itself. This low-level switching capability relieves users of the need to control an external H-bridge, and to install and maintain the heavy wiring needed to support it. Smart actuators require only two wires for power and a few thin control wires for communication with a simple switch, final element, PLC



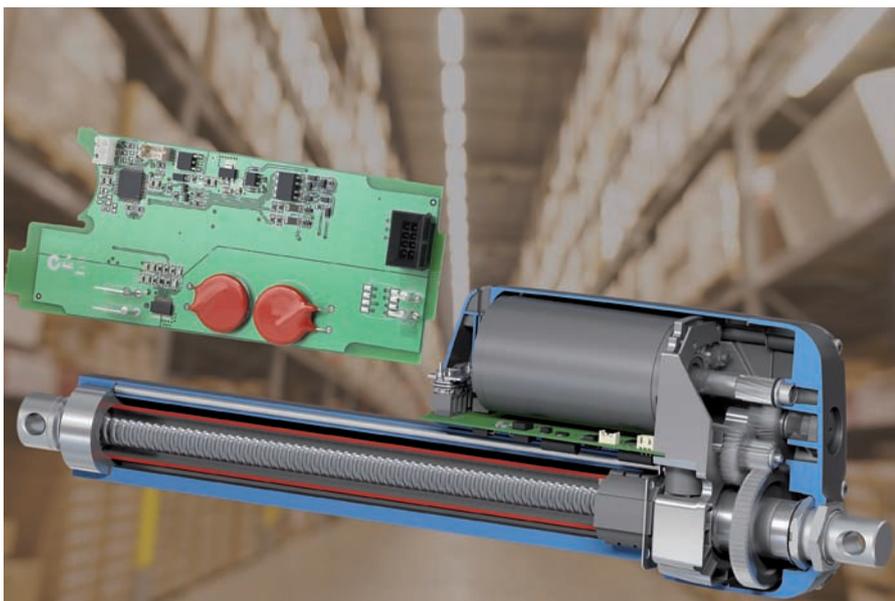
Smart actuators control conveyor adjustments and are popular in various plants. Packaging machines no longer need manual intervention for a changeover as smart actuators can now be programmed in advance to perform an automated switch



Smart electromechanical linear actuators are preferred over pneumatic- and fluid-powered actuators since they offer energy efficient solutions, a cleaner operation and require minimal attention to external wiring



Four actuators with built-in CAN bus-compliant intelligence



Smart actuators can reduce setup times for changeovers by taking the place of manual solutions

or other controller. This feature enables communications with network buses such as those using the J1939 CAN bus protocol for integration with other applications.

It is the combination of such capabilities at a reduced price point that makes the new generation of smart actuators a good idea for intermittent duty cycle change-over applications. Where using an actuator to control conveyor height might have previously required a costly, high-precision actuator supported by a complex system involving stepper or servomotors and external switches; with just a few wires, machine designers can now connect a cost-efficient actuator with precision fit for purpose to the main automation controller for programming it like any other function. As long as the system can communicate with the actuator, it doesn't matter whether the operation happens once a day or 500 times a day. Smart actuators provide great flexibility with a lower total system cost.

Automating and accelerating changeovers is especially valuable in plants that have characteristically short runs. Where a packaging machine product changeover might traditionally require manual intervention to switch from one product to another, a sequence of multiple products can now be programmed in advance, reducing setup time

Benefits for the maintenance function

As factories get smarter and smart actuators are adopted, maintenance teams will find them a simple and pain-free part of their overall automation system. Maintenance technicians and facilities managers will find that smart actuators are cleaner and more energy efficient than fluid power solutions and require minimal attention to external wiring. Any maintenance the smart actuators require will be assisted by diagnostic information delivered across the network bus. The onboard electronics can, for example, track the num-

ber of cycles the actuator has run, and provide temperature measures and current consumption. Analysis of these factors could help determine whether increases in temperature or power consumption are related to abnormal wear on the system or to application demands. This information can also benefit maintenance simply by shutting down a process to protect the application and before overheating or current spike damages the actuator.

Some OEMs are already using the communications capabilities to monitor actuator operations via the cloud to help end users manage spares and replacements more strategically. By tracking the number of cycles that have been run and forecasting replacement intervals for parts, manufacturers can alert customers of impending failures, and order, deliver, and even install new parts before the failure occurs.

Maintenance 4.0, IIoT and beyond

Increased adoption of intelligent actuators mirrors trends for many what is going on with most other devices on the plant floor. As valves, switches, pumps and other devices get smarter and better able to communicate, this will lead to greater efficiency resulting in a more productive and more easily maintainable environment.

►► 54620 at www.ien.eu

Enabling the Capture of Larger, High Definition Images

Resolve Optics Ltd, partnered with IMAO, won significant funding from the EU to assist in the development and bring to market a 1 GigaPixel Aerial Survey Camera: an interview with Mark Pontin, Managing Director at Resolve Optics

IEN Europe: Resolve Optics Ltd develops OEM quantity special lenses and optical designs for small and large high technology businesses. What's the history behind that?

Pontin: Resolve Optics Ltd was founded by Richard Harvey – an internationally respected Optical Designer. Richard's original mission for Resolve Optics was for it to fulfil the demand for a company that could design and manufacture bespoke optical systems in small to medium volumes. 20+ years later it is still the case that developing a product that requires bespoke optics can be a time consuming and expensive process. Over the last few decades - Resolve Optics has designed and manufactured for instrument, sensor and camera manufacturers around the world reasonably priced bespoke lens and lens systems to increase their competitiveness and to solve new applications.

IEN Europe: Which are the main areas and market sectors that are benefiting from your specialist lens design and manufacture capabilities?

Pontin: Over the last 20+ years - Resolve Optics has worked in a diverse array of market sectors. Our core markets are Machine vision, Nuclear, Military & Surveillance, Medical and Broadcast.

IEN Europe: Congratulations on recently receiving, in conjunction with your French partner IMAO, the funding award from the EU backed Horizon 2020 scheme. Can you please describe the scope of the project?

Pontin: Resolve Optics Ltd partnered with IMAO and won significant funding from the EU to assist in the development and bring to market

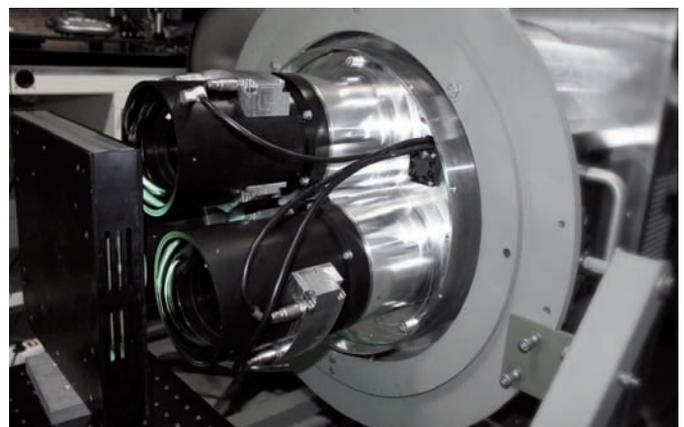


Mark Pontin,
Managing Director
at Resolve Optics

a 1 GigaPixel Aerial Survey Camera. These funds are provided to help to improve and perfect the manufacturing, testing and supply of, in the case of Resolve Optics the groundbreaking lenses required for the camera and for IMAO the build, set up and testing of the camera. This valuable source of EU funding has enabled us to invest in assembly equipment and a very versatile and accurate MTF and Distortion test table. The investment in such equipment will bring significant advantages to all our customers in terms of assurance of consistent high product quality.

IEN Europe: What is the current state of aerial surveillance cameras and what are their shortfalls?

Pontin: The aim of the IMAO aerial surveillance camera development has been to enable larger, high definition images to be captured. Being able





to capture larger images means that less images are required, and larger areas can be covered in less flying time. This equates to a significant reduction in cost of operation for organisations offering aerial surveillance services. Another advance that the IMAO cameras offer is their outstanding resolution - as it enables very accurate measurements to be taken from the captured images.

IEN Europe: I understand that you have already developed a 660MPixel aerial surveillance camera in conjunction with IMAO. What part did Resolve Optics play in this development and how has the market reacted to this product?

Pontin: The 660 Mpixel Camera was developed as a prototype/proof of concept device ahead of our ultimate aim to develop a 1 GigaPixel aerial surveillance camera. Resolve Optics designed and developed the three ultra large format high resolution lenses that lie at the heart of each camera. The 660Mpixel camera has been received extremely well within the international aerial photography community.

IEN Europe: The Horizon 2020 funding is to develop a next generation 1GPixel resolution ultra-large format aerial surveillance camera – what benefits will this new product offer and who will benefit most from its use?

Pontin: The aim of the 1GigaPixel IMAO camera is to enable even larger, high definition images to be captured. The 1 Gigapixel camera will produce high quality images significantly larger than the standard image size generated by other large format cameras on the market. Consequently, not only will less images be required for geographic data mapping but

also these images require less processing time saving operators time and money. As I mentioned previously the higher resolution will also beneficially enable very accurate measurements to be taken from the captured images. This development will provide a new benchmark for any organization involved with aerial photography.

IEN Europe: Working with cooperative partners in other countries, how does Resolve Optics manage this and ensure project goals are achieved on time?

Pontin: Collaborating with partners and customers in other countries is no longer a problem with modern communication technologies. We use VOIP teleconference systems to conduct interactive meetings with our partners and customers. These systems enable us to share files and desktops. This ensures that we are all looking at the same document, specification or 3D model. When used properly VOIP teleconferencing can be almost as good as a face to face meeting. With projects that are in the design process we regularly provide customer with updated 3D models (SolidWorks) so they can check the new bespoke lens will interface correctly with their camera or application. To ensure projects keep scheduling we use all the aforementioned tools, plus of course email communication and even face to face progress meetings. It really depends on what the customer requires.

IEN Europe: Thank you for this interview Mr. Pontin!

Marta Roberti

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EXPANSION CASE FOR ELECTRONICS

Installation friendly design with insertable cover panel



The extended case series GD from **Fischer** offers a particularly installation-friendly design and various functional properties for the integration of PCBs or electronic components. The new, one-side open, U-shaped case

profiles have integrated guide slots for the insertion of electronic components or PCBs as well as insertable cover panels, which can vary in the material thickness and therefore in stability. By means of a mechanical treatment of the cover panels various devices such as LCDs, connectors, etc. can be mounted easily and inserted in the U-profile afterwards together. The case series GD is available in six different sizes (100, 120, 160, 200, 220, 234 mm) as well as the surface finishes "black" or "natural colour anodized" as a standard.

►► 54611 at www.ien.eu

90W POWER SUPPLY

Certified for medical applications



GlobTek's GTM96900P-90VV series of desktop power supplies is designed and qualified for a host of applications including IEC61347 for LED lighting. The family is available in desktop configuration with 3 options for IEC inlets: IEC60320 C6, C8, and C14. Both grounded and

un-grounded double insulated configurations are available. The family of power supplies is available from 12VDC to 54VDC in 0.1V increments. The Power supply is rated 0°C to 50°C ambient temperature with full load. Fully certified for ITE, Medical, and household applications this family also doubles as an LED driver ideal for international applications by meeting Class C Line Harmonics.

►► 54613 at www.ien.eu

MODULAR 3D SMART SENSORS

For board scanning and material optimization



With Gocator 200 multi-point scanners from **LMI**, users can create a scanning system based on a modular design that allows a mix of 3D profiling, tracheid detection, and color vision for sawmills and planer mills looking to maximize wood breakdown decisions. The series is based on coplanar scanning that effectively captures both

the leading and trailing edges of lumber while minimizing conveyor footprint, offers true differential profiling for accurate thickness measurement, and can scale from 1 to 48 sensors to cover various lumber length requirements.

►► 54615 at www.ien.eu

QUANTIFICATION OF GAS LEAKS

Optical Technology for immediate Assessment



FLIR Systems, in partnership with Providence Photonics, announces new Quantitative Optical Gas Imaging (qOGI) technology, which is designed to work exclusively with FLIR GF-Series cameras. QOGI represents a critical step forward in the world of optical

gas imaging because it eliminates the need for secondary sampling devices to quantify gas emissions. By using QL320 in conjunction with a FLIR GFx320/FLIR GF320 camera, surveyors can now measure mass leak rates (lb/h or g/h) or volumetric leak rates (cc/min or L/min) for most hydrocarbons. The QL320 can be used at a variety of distances, so operators can monitor hard to reach areas and storage tanks as well as survey massive leaks from a safe location.

►► 54612 at www.ien.eu

MINI-ITX CPU BOARD

Durable Visualization in 4K



In-store kiosks or digital display windows require require small, compact systems that are equipped with latest technology and are standardized at the same time. A suitable entry-level model is the Mini-ITX CPU board KINO-DH110 from **ICP Deutsch-**

land. The 170x170mm CPU board is controlled by a Skylake or Kaby Lake Intel Core i7 / i5 / i3, Celeron or Pentium processor with max. 32GB DDR4 SDRAM memory. All three multimedia interfaces HDMI, DP ++ and internal display port (iDP) support a 4K UHD resolution of up to 3840x2160@60Hz. It works on 24/7 continuous operation, has a voltage range of 9 ~ 28VDC and an operating temperature of -20 ° C to + 60 ° C.

►► 54614 at www.ien.eu



POSITIONING WITH MAXIMUM RELIABILITY

2-D System with large reading window



The PXV 2-D absolute positioning system from **Pepperl+Fuchs** sets new performance benchmarks when it comes to reliability and handling. With its large reading window, the system keeps a sufficient number of codes in view, even in relation to track switches and changes to the code tape. The reading window of the

PXV has been enlarged to 120 x 80 mm, meaning that the Data Matrix code tape is always located within the detection range. The reading window has an increased depth of focus range, allowing it to capture even more codes simultaneously and also guarantee position detection through multiple redundancy.

►► 54616 at www.ien.eu

COMPACT SINGLE STAGE FILTER

With optional surge protection



SCHURTER has extended its popular and successful FMAB NEO filter family with varistor variants for surge protection. These are available on request. They have ENEC approvals for the entire current range as well as UL/CSA from 1 A to 20 A. The filter family offers maximum flexibility with three different filter designs. Design N

has two large X-capacitors for particularly high symmetrical attenuation in the lower frequency range; Design P has two standard X-capacitors for high symmetrical attenuation, while Design Q with a single X-capacitor provides good symmetrical attenuation. All an extended temperature range from -40 °C to +100 °C.



►► 54617 at www.ien.eu

ELBOW FITTINGS FOR MANY APPLICATION

Standardised solid metal connectors



Eisele develops and produces numerous versions of solid metal connectors. The BASICLINE alone comprises more than 4,000 standardised connection components. Numerous articles are available not only in a straight version, but also as an elbow fitting. They are supplying compressed air and are in use with vacuum especially in welding applications and harsh industrial environments. With one seal ring, the push-in connectors with a release sleeve are suitable for compressed air from -0.95 to 16 bar. With two seal rings the push-in connectors of the 14A series can even withstand pressures up to 24 bar. For fluids, under certain conditions, applications up to 100 bar are possible.

►► 54618 at www.ien.eu

HIGH-SPEED TRILINEAR CAMERA

Color line scan camera with conversation capability



The new **JAI SW-4000TL-PMCL** trilinear camera expands the options for designers of color line scan-based systems to deliver the maximum in color image fidelity, sensitivity, and configuration flexibility. The high performance trilinear technology has been combined with a set of advanced features to give designers an attractive alternative for applications not requiring the precision provided by prism cameras. The custom CMOS imager features not just three, but six separate lines of 7.5-micron pixels with two lines each of red, green, and blue pixels. The sensor's readout architecture combines the readout of two pixels through a single diffusion node to double the signal without increasing noise, enabling the binning process to increase sensitivity.

►► 54638 at www.ien.eu

MASS FLOW CONTROLLERS

Select functions for multiple gases



The **Omega FMA-2600A** Series mass and volumetric flow controllers use the principle of differential pressure within a laminar flow field to determine and control mass flow rate. A laminar flow element (LFE) inside the meter forces the gas into laminar flow. Inside this region, the Poiseuille equation dictates that the volumetric

flow rate be linearly related to the pressure drop. A differential pressure sensor is used to measure the pressure drop along a fixed distance of the LFE. This, along with the viscosity of the gas, is used to accurately determine the volumetric flow rate. Separate absolute temperature and pressure sensors are incorporated and correct the volumetric flow rate to a set of standard conditions.



►► 54088 at www.ien.eu

POWER OVER ETHERNET INJECTORS

Delivering power to where it is needed



Belden has released its new Hirschmann PoE/PoE+ Injectors, designed to support the growing demand for high-voltage Power over Ethernet. Ideal for industrial operations, such as trans-

portation and physical security, as well as process production and automation, these injectors provide increased port density and maximum power without load sharing. Each provides a stable, ruggedized housing specially designed for use in industrial environments. The injectors have plug-and-play capability with automatic device detection and standard DIN Rail mounting makes installation an effortless process. All variants support up to 240 Watts across up to 8 ports without load sharing.

►► 54637 at www.ien.eu

METAL BELLOWS COUPLING SERIES

Stiff and flexible for a wide range of torques



The metal bellows coupling **KM** from **JAKOB** uses only thin-walled, multi-layered bellows made of certified stainless-steel sheets. This causes a high torsional stiffness, which ensures high positioning accuracy and concentricity even under difficult conditions,

which guarantees absolutely backlash-free torque transmission between the input and output shafts. The multi-layer bellows design also causes the absorption capacity of large shaft displacements with still small restoring forces. The clamping hub of the KM is equipped with the innovative Easy-Clamp-System, which allows a simple, with enough fit clearance, sliding. The bellows and hubs are connected using the brass-wire press-fit method.

►► 54642 at www.ien.eu

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	Belden	25			
C	Camille Bauer Metrawatt	15			
	Conrad Electronic	11			
D	DECHEMA	23			
	Deutsche Messe	Insert			
	DFA Media	13			
	DIAS Infrared	11			
E	Eisele Pneumatics	25			
	Electrotek Concepts	9			
F	Fischer Elektronik	24			
	FLIR Commercial Systems	24			
	Fluke Process Instruments	15			
G	Globtek	24			
H	HBM Hottinger Baldwin Messtechnik	14			
I	ICP	24			
	ICP DAS	28			
	ICPDAS-EUROPE	15			
	igus	18			
J	J.D. Neuhaus	9			
	JAI	25			
	Jakob Antriebstechnik	25			
K	Keller	16			
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APRIL

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Böblingen
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23-27
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PAPERLESS RECORDERS
Offer real time display of data



Omega releases the RD1000/2000/3000 Series of paperless recorders, which offer real time display of data in a variety of formats on a high-resolution color TFT touch screen display. The user-friendly unit with plug and play cards can easily be sent to monitor, record and evaluate any application. The user can access data on the screen, as well as from a remote site via the standard Ethernet, web server or optional RS232/422/485 series interface. The unit's compact size of the paperless recorders saves space and minimizes depth required behind the panel.

►► 54006 at www.ien.eu

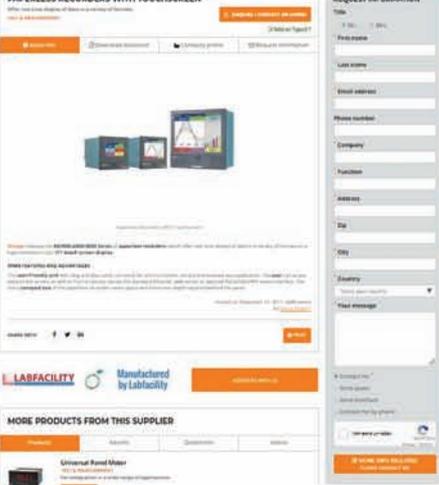
1. Do you want to know more about a product or technology you found in your IEN issue?



The screenshot shows the IEN website homepage with a navigation menu, a search bar, and several featured product articles such as 'High-Speed High Sensitivity Thermal Camera' and 'Early Identify Electrical Panels with your own Printer'.

2. Search directly on the IEN reference number using IEN.EU's search box. You can also search on any other keyword like supplier or product name.

PAPERLESS RECORDERS WITH TOUCHSCREEN



The screenshot shows a detailed product page for 'Paperless Recorders with Touchscreen'. It includes a 'REQUEST INFORMATION' form with fields for name, phone, email, company, and address. Below the form, there are logos for 'LABFACTORY' and 'Manufactured by Labfactory'.

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