

INDUSTRIAL ENGINEERING NEWS

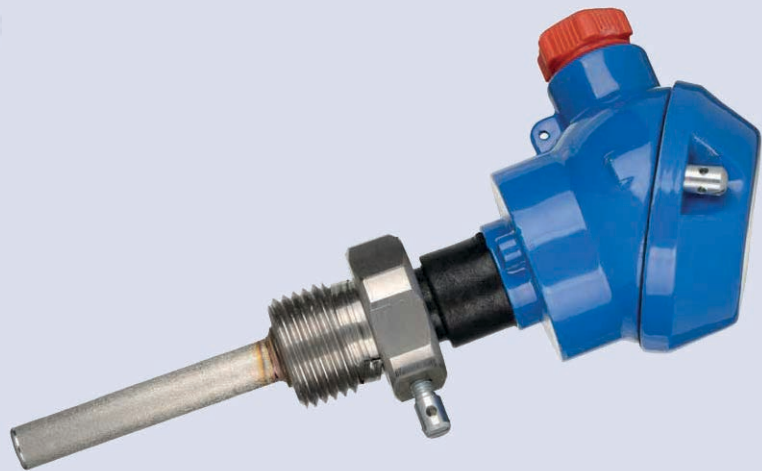
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Redesigning RTD-Based Temperature Sensors for the Smart Factory Age

A resistance temperature detector (RTD) can be quickly redesigned to meet smart factory demands for temperature measurement devices with smaller form factors, flexible communications, and remote configurability.

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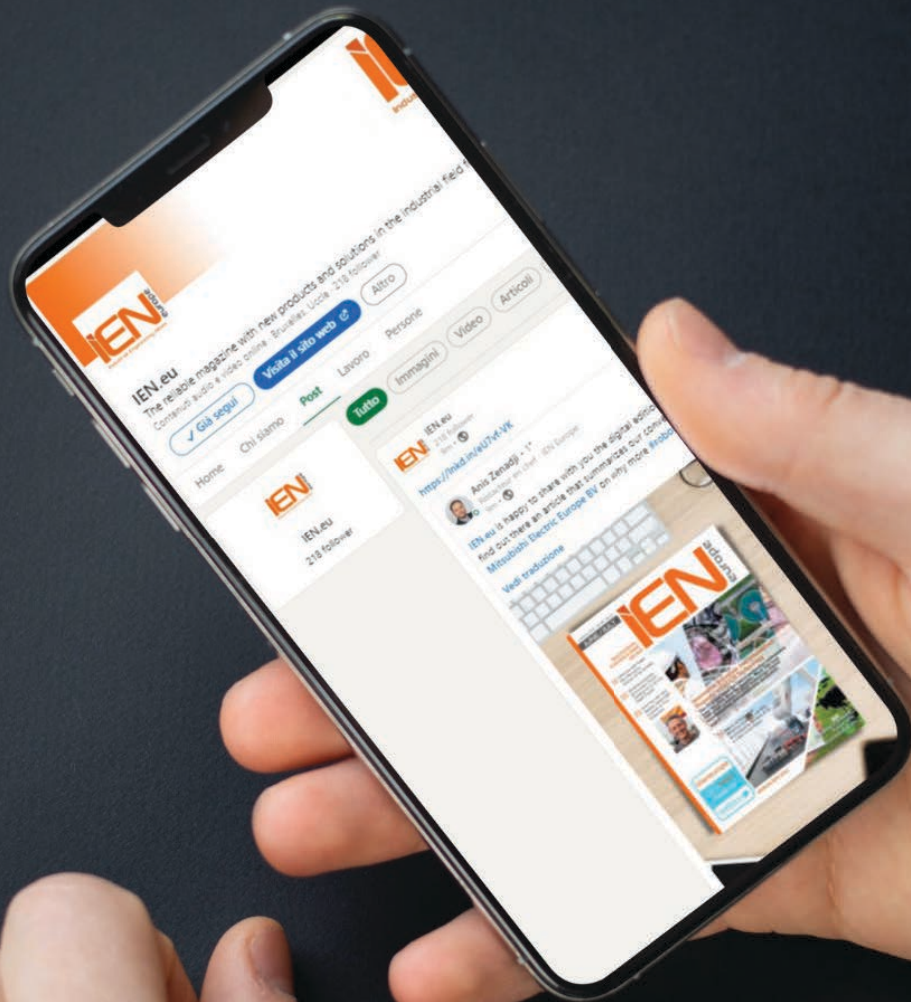


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a.zenadji@tim-europe.com**Dear Readers,**

Hannover Messe 2023 has been perceived as a more intense event as the one that happened last year. Not as many people as during the pre-covid era, but more valuable meetings and insights. The May issue of IEN Europe aims to bring you some fresh news from the industrial heart of Europe.

The April issue has an AI IEN section in it dedicated to smart manufacturing with two pieces from Artiminds and Farnell. The first one highlights 3 tips for a time and cost-efficient implementation on robot-based automation. Software that standardizes and simplifies programming allows the user to react simply, quickly, and flexibly to these and many other changes and to make necessary adjustments in the program itself. The second article is on the rise of Industry 4.0 as championed by many as the start of an exciting new industrial age. In this age we have barely begun to identify and subsequently reap the numerous benefits it promises.

In addition, preceding the June/July issue on water, research by ABB to mark World Water Day reveals a need to invest in an additional 469 wastewater treatment facilities annually. In this matter, early integration of technology to drive efficiency at plants is key.

We wish you a pleasant and interesting reading.

Editor for IEN Europe

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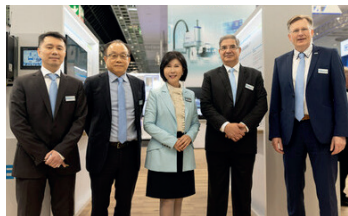
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Intelligent, Sustainable, and Connecting as the Key Words for Delta Electronics at Hannover Messe 2023

At Hannover Messe 2023, Delta Electronics launched its new brand value proposition, named 'Realizing an Intelligent, Sustainable and Connecting World'. Delta's innovative IoT-based Smart Green Solutions are aimed at contributing to mankind's emissions reduction goals by nurturing intelligent industries with smart automation, energy conservation and collaboration ecosystems at their core. Delta's intelligent Smart Manufacturing, sustainable EV Charging Infrastructure, and connecting Building Automation Solutions, all showcased at Hannover Messe 2023, are advancing the European Commission's "Fit for 55" policy and its EU climate-neutral by 2050 objective. These include the VP3000 Drive as a newly-launched fan, pump and compressor, as well as a full range of EV charging Infrastructure solutions, and two of Delta's own green building cases: The newly-built LEED Gold green building in Helmond, the Netherlands.



Canada will be Partner Country at HANNOVER MESSE 2025

The signing finalizes the agreement announced in August 2022 during German Chancellor Scholz's visit with Canadian Prime Minister Justin Trudeau in Canada. Germany is Canada's seventh largest source of foreign direct investment and one of Canada's most important sources of high-tech investment. More than 800 German companies operate in Canada, employing roughly 70,000 people. Canada and Germany also share a dynamic relationship in science, technology, and innovation, having initiated more than 1,000 cooperative research projects since 1971. The Canadian government and companies from the private sector are currently funding five superclusters in Canada with roughly €1.2 billion to reinforce innovative sectors and position them internationally. The goal is to create 50,000 jobs and economic growth of €34 billion over the next 10 years. Three of the super clusters – SCALE.AI, Advanced Manufacturing and Digital Technology – are key topics at HANNOVER MESSE.



Enhanced Process Variable and Diagnostic Standardization



ODVA. Process device profiles offer a standard format for process variables and diagnostics across an array of devices for smoother vendor interoperability and easier DCS and PLC data integration from EtherNet/IP-enabled field devices. Device profiles are available for Coriolis flow, electromagnetic flow, vortex flow, standard pressure, and scaled pressure devices. Process end users can now take advantage of Ethernet/IP devices with better communication of critical diagnostics such as NAMUR NE 107 status signals, and improved alignment with the Process Automation Device Information Model (PA-DIM). EtherNet/IP process device profiles enable enhanced vendor interoperability, easier access to process variables and critical diagnostics such as NAMUR NE 107 status signals, and more seamless integration with PA-DIM. Moreover, process field device profiles will allow for simpler commissioning and enhanced asset monitoring and integration into higher level PLC, DCS, and cloud-based systems.

Spetec Celebrates its 35th Company Anniversary

Founded in 1987, the Erding-based company initially started off by offering service and spare parts sales for commercial ICP spectrometers. An ICP spectrometer (inductively coupled plasma spectrometer in which a plasma is used to generate the spectral lines of the elements to be analyzed) is an analytical instrument used for detecting toxic elements in liquids, such as screening for mercury, arsenic or lead in drinking and river water or wastewater. In the years since its foundation, Spetec GmbH has grown rapidly, from a oneman operation to a company with a workforce that currently numbers around 80. The immense success of the company, the rapidly increasing workforce and continuing high demand, explain why a new company building with approx. 2500 square meters of production and office space as well as storage area on an area of approx. 9000 square meters in the industrial area in Erding was already put into operation in 2022. The same year marked the 35th anniversary of the company's foundation.



Hannover Messe 2023: FREYR to Scale Battery Cell Gigafactory Production with Siemens Xcelerator

Siemens and FREYR Battery to cooperate on large-scale and sustainable battery production as part of Siemens Xcelerator open digital business platform

Siemens and FREYR announced a strategic partnership today at Hannover Messe. Siemens will become FREYR's preferred supplier in automation and digitalization technology, enabling FREYR to scale-up production, and maximize its plant and energy efficiency.

Scaling battery production with Siemens technology

FREYR plans to equip its planned gigafactories in Norway and the U.S. with Siemens' Industrial Operations X portfolio. Industrial Operations X comprises a broad range of products and services for industrial operations that empower operational technology (OT) with integrated information technology (IT).

Siemens and FREYR will join forces along the entire battery design and manufacturing process, from production design, planning and simulation; product design and simulation to the automation of the entire production process. Siemens will provide a broad range of solutions from the Siemens Xcelerator portfolio including Product Lifecycle Management (PLM), Manufacturing Execution Systems (MES), industrial Edge computing, and tools for IT/OT connectivity.

By leveraging Industrial Operations X, FREYR will be able to better connect design and manufacturing to scale-up production. It will speed up FREYR's progress towards its planned gigafactories, increasing the availability of high-performing and affordable EV battery solutions as well as energy storage systems, and thus accelerating the transformation of the automotive industry and electricity grids.

Siemens strengthens its technological leadership in fast-growing battery market

With this strategic agreement, Siemens is expanding its footprint in the battery manufacturing industry. The company has recently signed several partnerships with leading companies, demonstrating its deep domain know-how in this dynamic and fast-growing market.

As part of their strategic partnership, Siemens and NVIDIA have developed a showcase for Hannover Messe highlighting the transformative potential of the industrial metaverse. A cloud based digital twin of the next-generation FREYR factories, created using AWS IoT TwinMaker and demonstrated in a custom Siemens application built on the NVIDIA Omniverse platform, the exhibit illustrates how companies like FREYR can make better and faster engineering decisions by visually interacting with, experiencing and utilizing the comprehensive digital twin across the product, production and service life-cycles in a high-fidelity, immersive environment. The model integrates operational data from the factory, 3D definitions of the building, plant, machinery, and equipment, human ergonomics and safety information, detailed production processes, robots and automatic guided vehicles, and simulations of products and production. The exhibit highlights the possible integrations between the Siemens Xcelerator and NVIDIA Omniverse platforms.

Siemens and FREYR to explore financing options and commercial value streams

FREYR is currently in progress raising project finance for Giga Arctic and raising equity for Giga America. Beyond the traditional customer-supplier relationship, the agreement between FREYR and Siemens will also include discussions about possible financing options via Siemens Financial Services, as well as a potential battery cell offtake agreement.



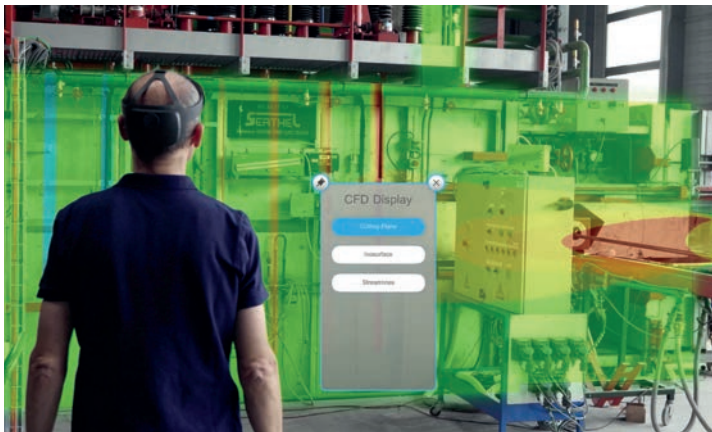
Operational Performance of Energy Assets with a View to Decarbonizing Industry

In the current energy transition, the challenges of managing industrial assets also include operational excellence. ENGIE used PTC's platform for its CRIGEN Lab to reach and deliver usable information

By creating a digital twin for 3D multiphysics simulation of an industrial furnace that is connected in real time to the IoT ThingWorx platform by PTC and combined with a mixed reality solution, the French energy company ENGIE's CRIGEN Lab has sought to optimize the operation of an industrial asset on its conversion to hydrogen.

Putting to use the digital twin of an industrial furnace

Since 2020, ENGIE's CRIGEN Lab is located in Stains (northern suburbs). The lab devotes part of its work to anticipating and supporting industrial developments in ENGIE by gaining a deeper understanding of cutting-edge technologies and enhanced operation of energy assets. Specialized in new energy sources as their uses and their impacts, this laboratory conducts research projects on energy resources linked to gas and runs innovative projects to boost and speed up the energy transition. In order to reach carbon neutrality, industrial assets must adapt to the different energy sources while maintaining performance and efficiency. Based on the notion that an industrial furnace could provide a first-rate experimental basis for digitally reproducing the hydrogen conversion of industrial facilities whose core process is combustion, the CRIGEN Lab took the decision to study its real-time physical and dynamic behaviours through 3D multiphysics digital simulation.



A data hub based on PTC's IoT platform, for delivering usable information

ENGIE's CRIGEN Lab has created a network of specialist partners who pooled their know-how and in-field experience to successfully complete the project. Then, ANSYS created a simulation digital twin that generated millions of data in real time. PTC managed these data and delivered the real-time connection with the industrial facility; and SYNERGIZ made immersive and realistic use of this data with Microsoft HoloLens mixed reality headsets. Collecting and centralizing data of different types from multiple sources, and standardising and making full use of this data called for a platform that was capable of supporting many industrial communication protocols. The ThingWorx solution was fully able to meet IoT connectivity requirements. Preference was given to the hybrid cloud so as to ensure full control of the system and greater agility in data recovery. The onsite installation and deployment of ThingWorx was straightforward, and the platform allowed ENGIE's CRIGEN Lab to retain internal control.

Exciting results

The ambition of this project lies first and foremost in its ability to embed a technology in order to demonstrate the relevance of IT/OT convergence and its benefits for those working in the field (operators, maintenance personnel, etc.). This goal was a success.



Everything is ready, the value chain is operating, and the collection of digital twin data through 3D simulation is meeting expectations. The user in the field donning the Microsoft HoloLens headset now has access to real-time information from the digital twin.

What has been done for a furnace can also be done for other energy assets. Thus, ENGIE's CRIGEN Lab is right on target in its role of thinking ahead and delivering proposals. "This is the very heart of our technological innovation mission and, in the present context, it is a huge plus to be able to chart the path ahead for revised energy consumption, thanks to the enhanced management of industrial assets", explains Guy-Alexandre Grandin, the laboratory Deputy Manager.



Redesigning RTD-Based Temperature Sensors for the Smart Factory Age

A resistance temperature detector (RTD) can be quickly redesigned to meet smart factory demands for temperature measurement devices with smaller form factors, flexible communications, and remote configurability. This article shows how

The old saying “if it ain’t broke, don’t fix it” cautions against tampering with something that performs reliably and regularly proves its worth. Arguably, this advice applies to the circuit design used in many RTD sensors that quietly and efficiently measure temperature in industrial manufacturing facilities worldwide. However, to meet the requirements of Industry 4.0, factories are becoming smarter, and it is becoming clear that many current RTD sensors will not be fit for purpose in these environments. Smaller form factors, flexible communications, and remote configurability are some features that automation engineers now demand from industrial temperature sensors, but incumbent solutions cannot support them. This article revisits the building blocks used in the design of many RTD-based temperature sensors and discusses the limitations that these impose on a sensor’s application. It then shows how to quickly redesign this type of sensor to equip it with the features required in this new industrial age.

Temperature Sensor Building Blocks

The building blocks of an RTD industrial temperature sensor are shown in Figure 2.

An RTD translates a physical quantity (temperature) into an electrical signal and is typically used to detect temperatures between -200°C and $+850^{\circ}\text{C}$, having a highly linear response over this temperature range. Metal elements commonly used in RTDs include nickel (Ni), copper (Cu), and platinum (Pt), with Pt100 and Pt1000 platinum RTDs being the most common. An RTD can consist of either two, three, or four wires, but the 3-wire and 4-wire versions are the most popular. Since they are passive devices, RTDs require an excitation current

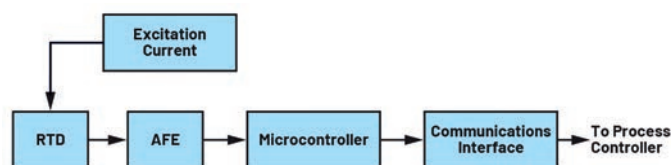


Figure 2. A block diagram of an RTD industrial temperature sensor.

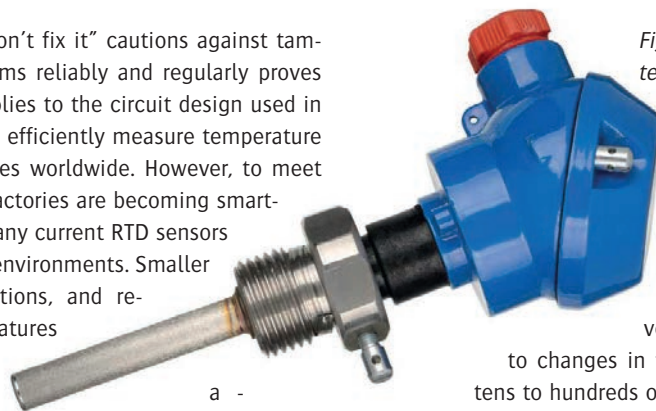


Figure 1. An example of an RTD-based temperature sensor.

to produce an output voltage. This can be generated using a voltage reference, buffered by an operational amplifier that drives current into the RTD to produce an output voltage signal that varies in response to changes in temperature. This signal varies from tens to hundreds of millivolts depending on the type of RTD used and the measured temperature, as shown in Figure 3. The AFE amplifies and conditions the low amplitude RTD signal before the analog-to-digital converter (ADC) digitizes it for the microcontroller to run an algorithm to compensate for any nonlinearity it contains. This sends the digital output to a process controller via a communications interface. The AFE is commonly implemented using a signal chain of components in which each performs a dedicated function, as shown in Figure 4.

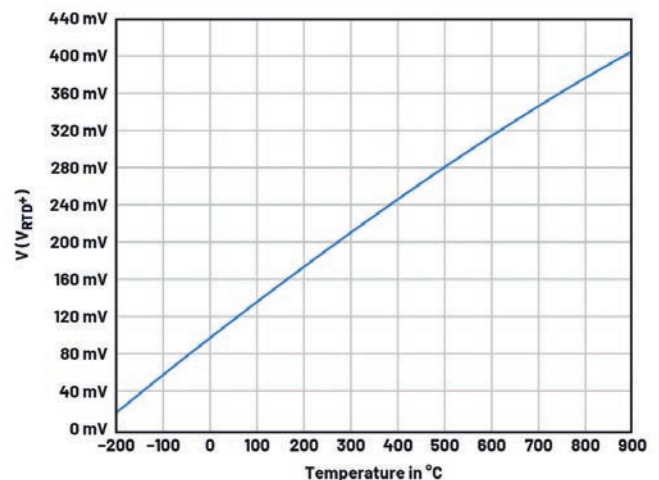


Figure 3. A voltage signal produced by a Pt100 RTD in response to increasing temperature.



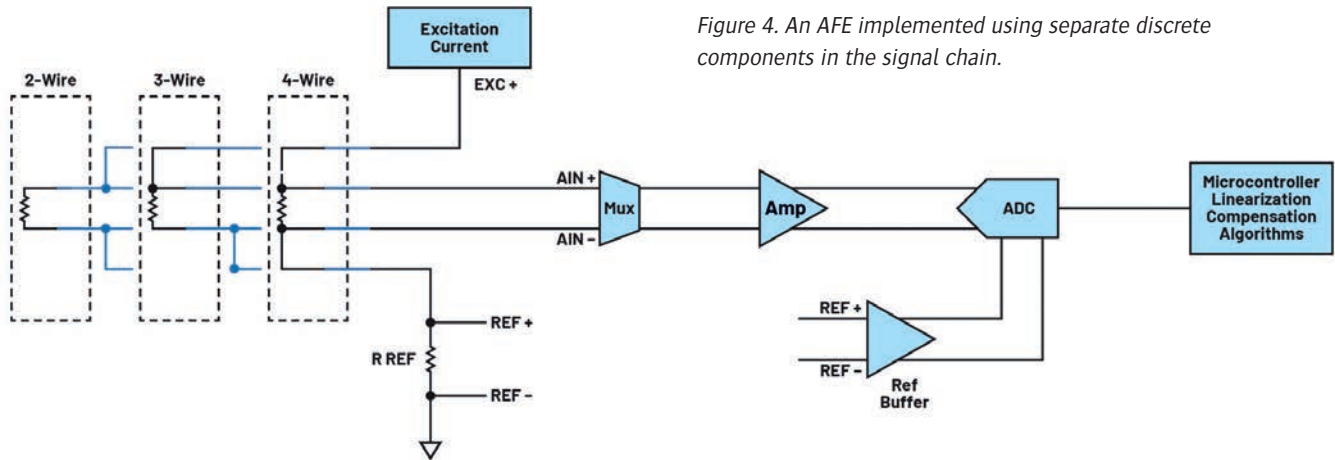


Figure 4. An AFE implemented using separate discrete components in the signal chain.

Many existing temperature sensor designs use this discrete approach that requires a printed circuit board (PCB) large enough to accommodate the footprint of all the integrated circuits (ICs) and the signal and power routing and sets a de facto minimum size for the sensor enclosure. A superior and more straightforward approach uses an integrated AFE like the AD7124-4 shown in Figure 5. This compact IC is a complete AFE in a single package and includes a multiplexer, voltage reference, programmable gain amplifier, and a sigma-delta ADC. It also provides the excitation currents for the RTD, meaning it can effectively replace five of the signal-chain components from the previous figure, significantly reducing the amount of board space required and enabling a sensor with a much smaller enclosure.

Communications Interface

Most industrial sensors are designed to connect to a process controller using one (or more) industrial networks, including the many variants of field bus or Industrial Ethernet. This requires an application-specific integrated circuit (ASIC) to implement the selected network protocols. However, this approach has several disadvantages. Firstly, including a network-specific ASIC in the sensor design significantly increases cost, especially if the industrial networks are proprietary. It also limits the market for a sensor to those customers using that network. For the same sensor to work with different network protocols requires redesigning to include the necessary ASIC, which can be time-consuming, high risk, and expensive.

Finally, the number and type of diagnostic features vary significantly by network type (with some providing none). Depending on the choice, it can be difficult for factory operators to identify and maintain sensors and any performance issues that arise once they have been installed in the field.

A better approach is to design a sensor independent of all industrial networks, thereby reducing development costs and broadening the potential customer base. This can be done using IO-Link, a 3-wire industrial communications standard that links sensors (and actuators) with all industrial control networks. In IO-Link applications, a

transceiver acts as the physical layer interface to a microcontroller running the data-link layer protocol. The advantage of using IO-Link is that it carries four different types of transmissions: process data, diagnostics, configuration, and events, allowing sensors to be

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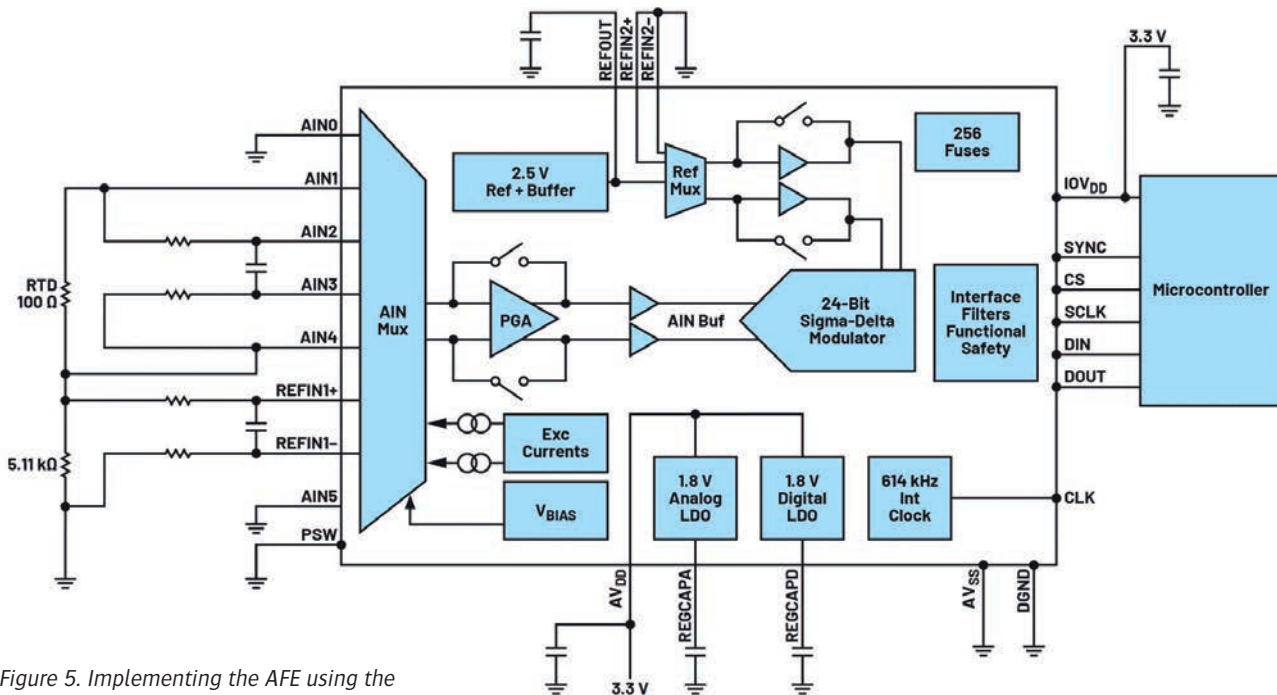


Figure 5. Implementing the AFE using the AD7124-4.

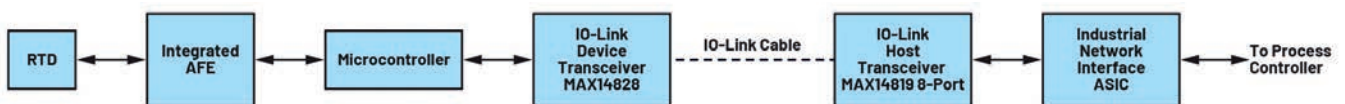


Figure 6. Communication with the industrial network is performed by the IO-Link host transceiver on the controller side.

quickly identified, traced, and attended to if a malfunction occurs. It also enables remote configuration—for example, if the temperature threshold for a process alarm to be triggered requires changing, this can be done remotely without needing a technician to step onto the factory floor. The MAX14828 is an example of a low power, ultrasmall IO-Link device transceiver. It is available in a (4 mm × 4 mm) 24-lead TQFN package and a (2.5 mm × 2.5 mm) wafer-level package (WLP), allowing it to be easily integrated into an industrial RTD-based temperature (and other types of) sensor. The transceiver enables a sensor independent of the industrial network because it communicates directly with an IO-Link host installed at the process controller side, which manages communication with the interface ASIC as shown in Figure 6.

Conclusion

Smart factory automation engineers have growing expectations of industrial temperature sensors, including smaller size, flexible communications, and remote configurability. This article showed how RTD temperature sensors could be quickly redesigned with a highly integrated AFE to reduce the enclosure size. It also showed how an IO-Link device transceiver allows the sensor to operate independently of the industrial network interface used to connect to a process controller. While this article focuses on RTD-based temperature sensors, this redesign can also be applied to temperature sensors that use thermistors or thermocouple transducers.

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A New Sensor Technology Caps Pharma Bottling Process

Story of a regular customer of Sensor Technology Ltd that has switched to its latest range of torque sensors

The new TorqSense SGR530/540, being introduced throughout 2020 and 2021, measures torque using a full four element strain gauge bridge. With this, four separate strain gauges are fixed to the drive shaft of the plant or machinery being monitored. The gauges are aligned so that each measures shaft deflection in a different direction as it rotates under load. Electronics within the sensor collects readings from all four gauges and uses them to calculate the torque value in real time. Sensor Technology has specialised in real time torque measurement for over 40 years, pioneering the use of wireless solutions based on radio frequency pick-ups that do away with the need for hard-wiring and unreliable slip rings. Strict international rules apply to the manufacture and packaging of pharmaceutical products

and require that the correct environment is maintained within the bottle or other packaging following capping. To this end, Regulation USP 671 provides a guide to the torque range to be used for screw type containers with varying closure diameters. By ensuring that bottle caps are successfully applied to the bottles within the required torque tolerances, the integrity of the product can be maintained. Over the years Sensor Technology has worked with many OEMs to develop high precision, high speed machines for use in pharmaceutical plants and a range of other applications. One of these, an Oxfordshire neighbour of Sensor Technology, has for over 10 years incorporated TorqSense units into its capping machines. Bottle capping is nearly always performed at very high speed, so that production targets are

met. A major advantage of TorqSense is that it does not need to physically contact either the bottle caps or shaft of the torque head it is monitoring, instead using a radio frequency link. This means initial set-up and change over to new product runs is fast and efficient while operational reliability is not dependent on delicate slip rings.

"All you have to do is set up a TorqSense transducer in the capping machine and turn it on," explains Mark Ingham of Sensor Technology. Significantly, the new SGR530/540 sensors are designed to be drop-in replacements for the older RWT430/440 units they are replacing. They are the same size and shape as their corresponding older model, with the same mounting holes, cables in the same position etc.

"All we have had to do to the capping machines is a straightforward swap-out of new for old. It only takes a few minutes," explains Mark. "Our new SGR TorqSense units are getting a realistic long-term work out on the capping machines, working for long hours at high speed, where they are required to be 100% reliable and consistently accurate."

Fast and accurate torque measurement is becoming more and more important as all sectors of manufacturing automate their physical processes while also needing to improve the recording of production performance data. TorqSense is used in many industries from automotive to materials handling, test and measurement, FMCG (fast moving consumer goods) production, power generation etc. Sensor Technology is working with user-partners in many sectors to assess the new SGR units in a range of working environment.



The separate sensing head and electronics housing of the TorqSense SGR530/540 series allows for easy mounting on machines where space is difficult to find

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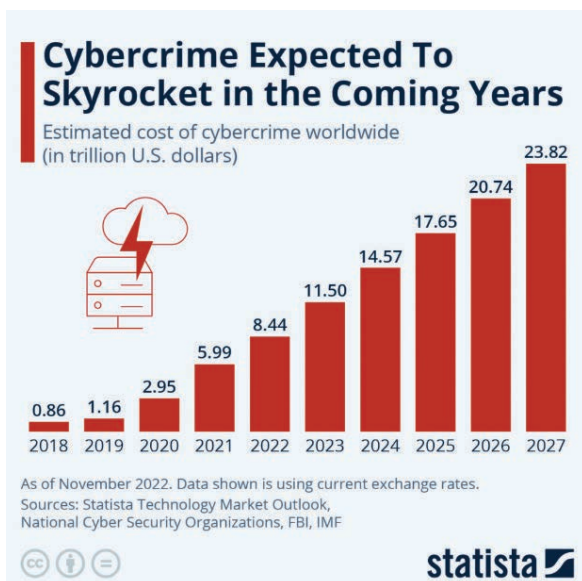
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Thriving in Tough Times: Navigating Cybersecurity Challenges During a Recession

With the onset of geopolitical tensions and the aftereffects of COVID-19 pandemic, is there anything hotter than cybersecurity right now?

Adding to the dismay comes an impending recession and ensuing global economic instability, which gives an ideal opportunity for cybercriminals to take advantage of the ill-prepared businesses seeking to cut expenses. However, companies nowadays allocate the smallest annual budget for cybersecurity, according to a Security Priorities Study conducted by Foundry. Considering the already tight budgets and an impending recession, it is crucial for organizations to wake up to the idea of cybersecurity and explore ways to establish a robust security stance without spending too much money.

The growing volume and sophistication of cyber-attacks, including but not limited to Ransomware, necessitate a heightened focus on cybersecurity. This makes the impending recession even more worrisome for businesses that are not currently equipped to handle such threats. Dealing with cyber-attacks involves more than just prevention and immediate recovery efforts. The response process can extend over months or even years, as investigations are concluded and legal matters are resolved. It is in an organization's best interest to ensure they are adequately prepared for an impending attack, rather than regretting later.



Everyone is at risk

Incidents such as Ransomware attacks, application data breaches, and phishing scams are becoming increasingly common, with hardly a day passing without a major news story about an organization falling victim. The truth is that everyone, from startups to Fortune 500 companies (irrespective of the industry) and CXOs to employees, is at risk of an attack. By 2031, Cybersecurity Ventures forecasts that Ransomware attacks will take place every 2 seconds, a significant increase from every 11 seconds in 2021. Moreover, the financial toll of these attacks is expected to reach an alarming level by 2031.

Zero Trust as the trump card

Employing a robust Zero Trust architecture and AI-powered self-healing Ransomware response solutions, is essential for both preventing and responding to cyber threats in real-time. A robust Zero Trust Security Framework can monitor threats by identifying unusual activities throughout an organization's network, covering both endpoint devices and applications. In today's hybrid work environment, devices frequently connect from various locations beyond the office, inflating the attack surface.

By implementing a robust Zero Trust strategy, IT teams can be notified of abnormal activities across the entire network with the ability to remotely freeze or shut down devices/apps to stop a potential breach from infiltrating laterally.

However, it is imperative for the Zero Trust framework be 'robust' to maintain operational efficiency. Zero Trust shuts off devices as soon as any suspicious activity is detected helping to prevent breaches.

A robust Zero Trust approach operates on a contextual basis, analyz-



ing each instance/feed of suspicious activity and notifies IT teams with secure access controls. For example, if an employee is on vacation in Italy and their device connects to the network from Italy, the device can remain online since the organization expects this activity.

When it comes to response solutions, self-healing and AI capabilities are vital for maintaining operations during serious cyberattacks. Self-healing technology enables the restoration and reinstallation of mission-critical applications to resume operations both during and post an attack. Self-healing AI-powered security solutions also aid in the recovery of endpoint devices, which are frequently left exposed and susceptible to reinfection after an attack.



Companies shall act now

Alarmingly, merely 23% of organizations have a formal cyber-security strategy in place. It is essential to understand that everyone is prone to cyber threats, and the primary focus should be on preparing for an attack, which involves both response and prevention.

Organizations ought to employ technology and staff training as elements of a prevention strategy, as detecting and thwarting cyber threats are the initial line of defense. In addition, readiness to respond is crucial in the event of a successful attack.

Being equipped to handle and recover from a Ransomware attack is particularly critical in industries like healthcare. If an organization lacks a plan to counteract an attack through a robust network, there may be delays or even data loss. This could result in slower response times for healthcare staff, leading to potentially grave consequences.

The need to prepare for and address cyber-threats is highly significant, but with an impending recession, it has become more crucial than ever.

Takeaway

To maintain a robust cybersecurity stance on a budget, companies can optimize their resources through upskilling and outsourcing. According to Cybersecurity Ventures, cybersecurity positions increased from 1 million in 2013 to 4 million in 2023, emphasizing a concerning shortage of cybersecurity professionals and an expanding skills gap. This number is expected to go insanely high in the coming years. Addressing this issue can be achieved by enhancing the skills of existing staff and IT teams through cybersecurity training, allowing them to better identify and report threats.

Various studies have repeatedly pointed to human error as the primary cause of data breaches, making it crucial for organizations to invest in

cybersecurity awareness and training programs. Outsourcing security operations to a trusted managed cybersecurity services provider is another cost-effective approach to strengthen your security posture, particularly when in-house staff is already stretched thin. Yes! A managed security services provider will act as an extended arm for your existing IT/security team helping you to thwart off coming-of-age attacks.

By outsourcing, companies can save money on full-time dedicated staff while complementing internal staff training to control expenses. Although having dedicated cybersecurity teams is ideal, a combination of training and outsourcing offers an affordable alternative while maintaining top-notch cyber resilience.

Today, cybercriminals employ automation to accelerate their attacks and launch novel types of attack tactics at an unprecedented pace. To effectively counter these attacks, it is essential to integrate automation into your cybersecurity measures. A managed security services provider can help you deploy the right layers of cyber defense for your organization utilizing cutting-edge security platforms and tools that help to swiftly evaluate data, track unidentified risks and establish as well as implement a comprehensive line of defense throughout your organization's network and IT architecture.

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N° 5 - MAY 2023

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Bearings and Services for the Sustainable Technology Sector

IEN Europe talked to Matthias Ortner, General Manager at NKE Austria and Hugo Santos, CBDO at Fersa Group, the NKE parent company and Pedro Pablo Andreu Fersa COO. An extended version of the interview is available online at www.ien.eu/bingo/63679.

Author: Anis Zenadji

IEN Europe: What makes NKE Bearings different from other bearing manufacturers in the market?

Ortner: NKE Bearings, Austrian manufacturer located in Steyr, has established itself as a leading manufacturer of high-performance bearings, since its foundation in 1996 by a dedicated team of engineers and craftsmen.

We are a leading provider of bearings for wind turbines, while also producing a comprehensive range of standard and custom bearings for all industrial applications. These bearings can be produced with short lead times and are tailored to the specific needs of each customer. Being a solution provider, a bearing is just the initial part of the value we offer to our customers, with services getting increasingly more important.

One of our key differentiators towards other manufacturers is the “best of both worlds approach” we offer. Being part of the global Fersa Group allows us to provide all the perks of a multinational company, that is vast engineering and R&D capabilities, global production sites as well as in-depth Quality competencies. At the same time, being a family-owned business, we are fast in decision making, agile and flexible in everything we do.

Based on a deep understanding of each application, we offer customers a multitude of Engineering services – like bearing design and selection, lifetime calculations, benchmarks, FE calculations - and help them improve their process flows. Recently, we analysed the end-to-

end bearing journey of a customer specialized in Wind Turbine Generator repair. Based on this exercise, together with the customer we developed customized packaging, an improved installation and handling process. On top, we trained the service personnel of the customer in their local facilities. With this, we can significantly improve the up-time of the Wind Turbine Generator creating a win-win situation for everyone.

IEN Europe: When we are talking about the different bearing types you are delivering for Wind Energy, what are the typical loads they have to handle and how long is the endurance of a typical bearing in that environment?

Ortner: NKE manufactures bearings for the entire mechanical power-drivetrain of wind turbine applications, that is mainshaft bearings, gearbox bearing solutions as well as generator bearing solutions. The bearing loads and rotating speeds vary considerably due to constantly changing winds. This means the features of wind turbine bearings is that they have to operate in a wide range of loads from light to heavy loads.

- The force that the main shaft bearing carries mainly includes the weight of the rotor and the hub, and the force of the wind acting on the main shaft through the wind rotor.



Matthias Ortner, NKE (L.) Hugo Santos (m.) and Pedro Pablo Andreu from Fersa





- The power of wind turbines is increasing, which means that the loads that have to be transmitted by the gearbox and its bearings are increasing too. The individual loads and requirements vary from bearing position to bearing position. i.e., planet carrier bearing's speed is very less compared to high-speed shaft bearing speeds...
- The loads within a Wind Generator are typically not a problem. But one of the main threats to bearings in variable-speed wind turbine generators is stray currents. If current is routed through the bearing, it can cause micro-pitting and other types of surface damage. Eventually, the bearing can fail – potentially leading to a catastrophic failure of the generator. In order to avoid this passing of the current, NKE developed the SQ77earing portfolio, which are bearings featured with a ceramic layer on the inner or outer ring. Further we offer innovative NKE Hybrid Bearings which are featured by ceramic balls instead of common steel balls. The ceramic balls provide best insulation characteristic, but also offers a lot of other advantages, such as high-speed suitability and best dynamical behaviour due to less weight, best running noise characteristic and also an extended service lifetime under severe lubrication conditions.

IEN Europe: You have a strategic focus on developing bearings for sustainable technologies, what are the specific challenges for bearings in the wind energy or rail sectors? How do you tackle those problems or challenges in terms of technology and innovation?

Santos: As the wind turbines get bigger and bigger, it requires a completely different set of skills when it comes to production, testing, and transportation of the new products. To address this fact, we are working on different actions.

One of our approaches is developing bearings with "Power Dense" technology that can support the same load ratios as traditional bearings with a 10 to 20 percent reduction in terms of size and weight. We are also offering Sliding bearings, a technology disruption that replaces the traditional rolling bearing for a sliding surface which allows us to maintain the reliability of the application while reducing the size by 40 to 50 percent compared to a traditional bearing. In this

Cylindrical roller bearing from NKE and taper roller bearing from Fersa



Cylindrical roller bearings with black oxide finish from NKE. Bearings used in wind turbine gearboxes are commonly coated with black oxide as protective layer



regard, we have entered a partnership with Kugler, a Swiss producer of bimetallic components and tribological surface finishes.

Applications control and monitoring while in operations are highly demanding in both wind and rail sectors when it comes to the reliability of the application, and the customers want to maximize the operation time. To address this fact, we are working on different approaches. We have developed a condition monitoring sensor to control the performance of our bearings once they have been installed in the application from a remote location to predict potential failures. We also have launched a new product line known as Hybrid Bearing that ensures complete electrical insulation between the rotor and stator. This product line combines standard steel rings with ceramic rolling elements, ensuring electrical insulation while performing better in extreme conditions with way lower vibration and noise levels than traditional bearings.

Fast technology development that results in a short life cycle of our products is another challenge. To address this situation, we work on the flexibility of our manufacturing process together with an extremely agile engineering support. As a result, we believe we have one of the fastest time-to-market processes in the bearing industry.

IEN Europe: NKE is a member of the Spanish Fersa Group now for some years. What synergies has this union generated? What does Fersa Group bring to NKE and what does NKE bring to Fersa Group?

Andreu: The acquisition of NKE represented a crucial and preliminary achievement in our global strategic plan. We discerned significant indicators amidst an array of complexities that required attention, including instability in the automotive market, disruptions in the supply chain caused by geopolitical issues, heightened emphasis on climate change and net-zero transition, and pronounced pricing pressures.

The inclusion of NKE within the group has resulted in a more robust local-to-local business, diversified revenue streams beyond the automotive industry, and an augmented green revenue stream, in addition to access to top talent in central Europe. As a member of the Fersa Group, NKE has benefitted from economies of scale, access to advanced technology, and capital investment to sustain exceptional growth.

IEN Europe: Thanks for these insights!

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Robot-based Automation: 3 Tips for a Time and Cost-efficient Implementation

Why no-code & low-code tools have become indispensable in robotics

Using robots is almost always worthwhile for companies. They can reduce labor costs, relieve employees, and make production more flexible - because the required batch sizes are becoming smaller and production processes more individual. In addition, a robot or cobot offers another major advantage: it can work without breaks and fatigue, thereby increasing product quality and reducing scrap.

With modern robot systems, almost all processes can now be automated. Usually, robots take over simple, dirty, monotonous, physically demanding, or even dangerous tasks. However, with the right hardware and, above all, software, very complex or particularly demanding tasks, so-called "Advanced Robotics" applications, can also be solved. Examples of this include the assembly of flexible and bendable components such as cables, wires, or hoses or force-controlled surface processing.

Following the no-code/low-code trend, there are various software solutions on the market that enable graphical and therefore simplified and faster programming. The advantage is that no special programming skills are required. The portfolio ranges from manufacturer-specific solutions to independent offerings that can be used to program robots from different manufacturers with one single software. Especially in the latter case, experts recommend using tools that automatically generate native robot code for the particular robot controller instead of controlling the robot arm via a separate IPC.

In the first case, users remain flexible when it comes to adjustments or optimizations during operation and avoid a lock-in effect, as they can con-



Advanced robotics applications such as the assembly of flexible cables pose a major challenge for classical robot programming

tinue to program the robot in the traditional way using line code even without using the software.

Whether with external engineering tools or line code, there are factors on the path to robot-based automation that users often underestimate and therefore do not pay enough attention to. How to avoid three of the most important stumbling blocks will be briefly explained below.

Factor 1: Programming effort

The time required for programming an application is usually not underestimated, but there are other pitfalls in this phase: for example, process tolerances and variances that have not been taken into account or the increased complexity when incorporating sensors or establishing a communication between the robot and a PLC. In addition, programming a system is often a tailor-made and complex solution that is difficult to adapt. Moreover, programmers often have their own style, which can make the resulting code or program difficult to understand and modify for other programmers. At this point, the market supports the user with the aforementioned no-code/low-code solutions. For example, with pre-defined function blocks, programs can be constructed and structured in a clear and understandable manner for others. Process tolerances and variances can



No-code/low-code tools simplify and speed up robot programming thanks to their template-based approach





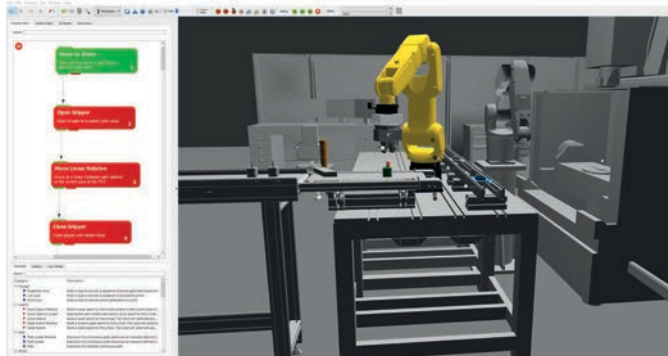
also be automatically compensated, analyzed, and optimized by using the right software. If the corresponding interfaces are already integrated, the effort required to connect sensors or set up a PLC communication is also immensely reduced.

Factor 2: Effort During Commissioning

A rule of thumb states that the cost of the robot itself is only about one-third of the initial cost of the cell, and experience shows that around 45 percent of the typical costs are incurred during ramp-up. This is because users often underestimate the time required for commissioning. Although the system is programmed offline and simulated throughout in advance, differences between theory and practice often become apparent during commissioning.

Thus, despite good preparation, the process can take significantly longer than planned, and adjustments and changes can quickly become expensive. In addition, factors that were not apparent during digital preparation now need to be addressed on-site during commissioning. This makes this phase difficult to calculate. With consistent tools, the ramp-up can be implemented in a controlled manner and without great loss of time, so that this phase does not become a cost driver. It is important to combine simulation, programming, sensors, and data analysis in one single software package. This way, the engineering chain becomes consistent without the user having to compromise on functionality.

This makes changes and adjustments faster, more flexible and easier. With ideally automatically generated robot code and the ability to transfer teach points back from the real robot into the software, such a solution integrates seamlessly and optimally into existing commissioning and



Programs can be structured and made traceable using pre-defined function blocks. Before commissioning, the process can be simulated as realistically as possible in a 3D simulation environment and tested

When teach points can be transferred from the real robot back to the programming software as well, such a solution seamlessly integrates into the commissioning process and saves unexpected effort

maintenance processes. This also offers the greatest flexibility in terms of online and offline programming, allowing the user to choose the best option and easiest way for the respective task.

Factor 3: Changes during the lifecycle of the cell

Even when the robot is running, there is still a danger that is often not considered: Over the system runtime, numerous changes in general conditions can occur that require adaptation of the programming.

These can be vibrations and shocks, for example caused from forklifts or other machines, wear and tear of tools, replacement parts that react differently than the previous components, changes in workpiece batches, and the space available in the hall or a change of the operating personnel. Changed lighting conditions and temperature conditions or the difference between a cold-started and warmed-up robot can also have an impact.

Software that standardizes and simplifies programming allows the user to react simply, quickly, and flexibly to these and many other changes and to make necessary adjustments in the program itself. If the worker uses a tool that also makes changes or the resulting consequences visible early on in terms of forces, cycle times, or defects and quality, it becomes easier to analyze and derive possible optimizations, which makes the user best prepared.

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■ Main Specifications

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Resolution	less than 0.005%FS
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Industry 4.0 and the Drive to Sustainability

The rise of Industry 4.0 is championed by many as the start of an exciting new industrial age in which we have barely begun to identify and subsequently reap the numerous benefits it promises

Chief among those benefits is sustainability. The benefits derived from the ability to use artificial intelligence (AI), machine learning (ML), and cloud-linked sensing technology will all accrue to demonstrably efficient energy saving practices plus better ways to replace and outperform aging, wasteful and polluting legacy technologies. Still, industry must continue to produce, and grow exponentially, to meet the ever-increasing demands for food, power and manufactured goods to serve the multiple needs of a growing global population. But it must do so more efficiently, which is a fundamental premise of the transition to Industry 4.0.

The sustainability benefits of Industry 4.0

Manufacturing companies currently face an unpredictable world of volatile prices, supply chain issues and energy scarcity. However, one constant in the midst of those challenges is the need to become a more sustainable manufacturer. In fact, becoming more sustainable and environmentally responsible can go a long way to solving the other issues.

In the face of increasingly important legislation, the need to reduce waste, and buyers who want to do business with a company that takes its environmental responsibility seriously, manufacturers are increasingly looking to improve sustainability as a way to transform their day-to-day operations as well as their business fortunes.

This is borne out by a survey by SAP Insights Research Centre [1], which shows that senior manufacturing leaders are adjusting their approach to operate more sustainably and mitigate risks more proactively. Some 33% of survey respondents cited increasing sustainability in their products and services as one of their top three priorities, on a par with expanding to new market segments.

As well as its environmental aspects, sustainability in manufacturing also means being able to continue manufacturing products that meet customers' needs. Many smaller and medium sized companies do not have the margins for error or scale that can cushion larger corporates, so achieving less wastage, better energy use, and better quality through more sustainable manufacturing practices can help them grow revenue and reduce risks.

The SAP survey found that in a world where customers demand more, and with pressure from investors, regulators and partners to be more socially and environmentally aware, many manufacturers see a cor-



Massimiliano Cifalitti , ABB Smart Power Hub Division manager Europe

porate programme of improving sustainability as a key competitive advantage.

Industry 4.0 is accessible to all

The advent of Industry 4.0 is designed to help enterprises of every size learn about and deploy various means to make the best use of their resources. Although small- to medium-size enterprises may be on a different trajectory in that transition simply as a matter of economics, Industry 4.0 with the Internet of Things driving its core functionality, is inherently scalable, which will ultimately make business more profitable and their resources more sustainable.

The benefits of partnering

A large number of Industry 4.0-style deployments are taking place globally every day, and the benefits are easily measured. Farnell has made a significant effort to publicise many real-life examples of Industry 4.0 success stories through its series of "Innovation Experts" eBooks that recount the experience of partner transitions, told by the people who initiated them, in a wide range of industries across





Farnell's customer portfolio. (The Innovation Experts series is available here.)

These success stories also highlight the benefits of partnering. For example, Farnell partners with ABB Smart Power, which offers multiple solutions to help them help their clients to improve energy efficiency.

According to ABB Smart Power's Hub Division manager, Europe, Massimiliano Cifalitti, "ABB Smart Power offers digital solutions for the complete Industry 4.0 journey. We really believe that a smart manufacturing unit should be focused on energy resiliency and sustainability, to ensure cost savings and reduce emissions.

"In this way, energy self-sufficiency and carbon neutrality become not only inspirational words, but pillars of our operations. To support those pillars, we provide several solutions that can help facility and energy managers make decisions based on evidence."

ABB provides several smart products such as circuit breakers, UPSs, motor relays, panel displays and switches and many others. These have embedded metering and connectivity to allow integration with IoT architecture. Concentrators and gateways ensure a cyber secure connectivity of the gathered data to 'ABB Ability Energy Manager'. ABB Ability Energy Manager is an on-premises and cloud-based energy management system. Available as a Software-as-a-Service solution, it helps detect energy inefficiencies within a plant.

The data collected from the installed meters are analysed to establish benchmarks, provide forecasts, generate what-if analyses, and set KPI targets such as energy performance indicators. Presented as reports, these analyses enable energy managers to make much better decisions and verify the results of their energy saving efforts.

Being predictive rather than preventive

The extensive deployment of sensing devices as part of the Industrial Internet of Things (IIoT) boom that is a major component of Industry 4.0, is a hugely proactive endeavour. Moreover, it is about predictive rather than preventive maintenance, a key driver to becoming more sustainable.

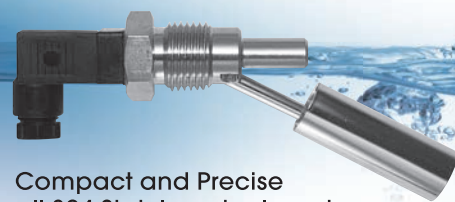
In addition to capturing data about performance, quality and energy use, Industry 4.0 devices that are enabled by IoT sensors provide a wealth of highly accurate, real-time information about the precise health of machinery as well as the goods or services they are producing.

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These real-time health checks contribute to sustainable manufacturing by facilitating predictive maintenance, which uses data - not for regularly scheduled preventive maintenance that was going to happen anyway - but to analyse vibration, heat, noise and other data that monitors multiple performance parameters to make a highly in-



formed prediction on when maintenance tasks actually need to be performed.

Matt Wieborg, a Solution Architect at another Farnell partner, Advantech, explained it well when he said, "Predictive maintenance is steadily replacing more traditional run-to-failure-type maintenance programmes. Although preventive maintenance is still used, and is even appropriate in some cases, it leaves too much money on the table. A very simple analogy would be changing the oil in our cars. We all do it on a regular basis, but what if the existing oil still has usable life in it? By draining and replacing it, you're wasting oil that is still viable and replacing it with an unnecessary expense... and you're consuming more oil than you need.

"In predictive mode, operators can more effectively schedule maintenance to fit with production schedules and carry out any necessary repairs before the machine fails and, equally importantly, schedule those maintenance sessions during periods of lowest usage to minimise downtime. In short, it eliminates unnecessary guesswork that, in turn, promotes sustainability through less waste and saves money by not replacing items that don't have to be."

Conclusion

Sustainability is increasingly seen as vital to not only ongoing viability of industry, but the viability of the planet and has become a core tenant of many business operations. Sustainability through Industry 4.0-driven technologies and techniques reduces the use of increasingly scarce and costly resources, it also means that manufacturers can continue to improve the quality of their products while reducing wastage and conserving resources - all at an acceptable manufacturing cost.

By partnering with like-minded businesses that can help to provide the tools and technologies to access far more detailed insights about systems and processes through highly automated, sensory Industry 4.0 devices, companies will be able to achieve their major goal of taking sustainable operations to new and, as many will rightly insist, essential levels.

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^[1] https://www.sap.com/cmp/dg/transformation-mindset-manufacturing/typ.html?pdf-asset=308bb12f-267e-0010-bca6-c68f7e60039b&page=2&client_id=8c183ca0-70ba-11ed-94b4-533687d4e40f&ut=L2RvY3VtZW50cy8yMDlyLzA0LzAwOGJmMTI2N2UtMDAxMCIyE2LWw2OGY3ZTYwMmM5Yg%253D%253D



Membrane Switches with Integrated 7-segment Display

SCHURTER offers an integrated solution of a membrane switch with numeric display that is easy to mount and allows an overall thickness of less than 2 millimetres

The membrane switch is still state-of-the-art as an operating panel for machines and equipment. A membrane switch is versatile and reliable, even under the most extreme conditions. By choice of construction, a high IP rating can be achieved, making the switches also suitable for use in conditions where other types of switches are not adequate.

In the shadow of the popularity of touchscreens, the membrane switch can often be somewhat underrated. The integrated solution comprises a membrane switch with numeric display. Easy to mount, the solution allows an overall thickness of less than 2 millimetres.

Display with a thickness of just a few millimetres

Account manager at SCHURTER Electronics Sjoerd Mensonides: "This solution is suitable for any application where a numerical value has to be entered or read out via a switch. Think of an oven with a choice of different settings or a tire air pump where the desired pressure can be set. With the switch, a selection can be made while the value is read on a 7-segment display, the familiar seven dashes that together form the digital number 8. By equipping this display with SMD LEDs, many colours are possible and the flat overall construction of the membrane keypad requires only a few millimetres. For applications with a low installation depth, the membrane keypad should be as thin as possible. The big advantage of this integrated solution is the small space requirement." Andre Borneman, Team Leader Engineering at SCHURTER, adds: "In traditional membrane switches, such a numerical display is a separate component, a block about 8 millimetres high. Until now, this block was assembled on a separate rigid PCB and this assembly was integrated into the application behind the front with a foil over it. With this new membrane switch variant, the display unit is already integrated into the circuit of the flexible membrane switch. No additional recess needs to be provided for the 7-segment display in the housing of the application. The membrane switch including the display unit is mounted directly onto the housing over its entire surface. Only the tail still has to be routed through a housing opening.

Contemporary upgrade

Mensonides: "So it really is an upgrade from a traditional membrane switch. This new variant is easier to install and reduces handling and installation time. The design of the membrane switch with 7-segment display is completely customised and allows for a stylish and modern look of the front panel in customised colours."

The right membrane switch for every solution

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An Additional 8.56 billion Cubic Meters of Wastewater a Year Needs to be Treated to Meet UN Water Targets by 2030

Research by ABB to mark World Water Day reveals a need to invest in an additional 469 wastewater treatment facilities annually. Early integration of technology to drive efficiency at plants is key

Global wastewater treatment capacity needs to increase annually by 8.56 billion cubic meters and investment in an additional 469 treatment facilities per year is required to meet 2030 United Nations (UN) goals. These are the findings of independent research commissioned by ABB ahead of World Water Day (WWD) on March 22, 2023.

As the UN prepares to report on progress made against its Sustainable Development Goals (SDG), ABB's research focuses on SDG 6.3 which aims to improve water quality by halving the proportion of untreated wastewater globally, increasing recycling, and minimizing the release of hazardous materials. The UN says 2.2 billion people lack access to safely managed drinking water, while more than 4.2 billion people lack safely managed sanitation.

Wastewater treatment targets need to be achieved in the most energy and resource efficient way possible

However, treating wastewater is energy intensive, with the industry consuming up to three percent of the world's total energy output and contributing to over 1.5 percent of global greenhouse gas emissions. "This research proves more needs to be done to help support the UN goals and accelerate progress in tackling water scarcity," said Brandon Spencer, President of ABB Energy Industries. "But we need to ensure



Aerial view of the wastewater treatment plant

we are achieving these wastewater treatment targets in the most energy and resource efficient way possible to make it sustainable. This is where technology is key."

While increasing wastewater treatment capacity is a priority, the early integration of technology to drive efficiency at plants is also vital. ABB's automation, electrification and digital solutions are helping monitor, analyze and manage wastewater plant operations. In association with crucial measurement and control solutions, which collect and transmit a wealth of operational and diagnostic data, ABB systems





ABB's Aztec600 for monitoring ammonia in wastewater treatment plants

report from 2021 assessing the volumes of wastewater collected, treated, and reused. The research, which is used by the UN, concludes that 48 percent or 171.3 billion cubic meters of wastewater is uncollected or untreated annually. To meet SDG 6.3 – which targets halving the proportion of untreated wastewater by 2030 – these figures need to be reduced to 24 percent and 85.65 billion cubic meters. In 2022, ABB's Energy Transition Equation report analyzed how better use of wastewater could relieve pressure on water supplies through greater integration of automation and digital technologies: It appeared that wastewater sites can reduce carbon emissions by up to 2,000 tons per annum. Moreover, with over 50,000 plants worldwide, 100 million tons of CO₂ could be saved each year. Last, by applying a package of automation and digital solutions, water companies can reduce carbon emissions as well as deliver annual operational savings of up to \$1.2 million per plant.

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help optimize resource efficiency and reduce energy consumption. Development Economics, which has over 20 years' research experience, utilized the same data employed by the UN to assess what real-term measures are needed. Based on modelling using a 50-million-liter daily capacity wastewater treatment plant as the benchmark, a further 469 treatment facilities – the volume equivalent of 3.4 million Olympic swimming pools – is required each year.

Reducing carbon emissions and gaining savings with automation and digital solutions

The scale of the challenge linked to UN SDG 6.3 is highlighted in a

ABB optical sensor ADS420 for measuring dissolved oxygen in wastewater treatment plants



FIXED FOCUS LENSES

For radioactive processes



Designed to provide a focal length of 6mm or 9mm respectively, the Model 214 and 286 radiation tolerant lenses offer high quality images with minimal geometric distortion from 400-750nm. Designed for close-up monitoring of radioactive processes, these durable lenses are specifically designed for

use with 2/3-inch image format radiation resistant tube and CMOS cameras. Key features of the Model 214 and Model 286 lenses include their wide field-of-view and variable iris control. However, producing clear, sharp images free of a strong yellow tint has traditionally been a limiting issue when using radiation tolerant lenses on colour CMOS cameras. To provide a solution for this problem, **Resolve Optics** developed the Model 313 - a 25mm focal length fixed focus lens. Using specially selected cerium doped glasses with the least amount of yellow tint, the Model 313 offers high clarity, natural colour images. Resolve Optics comprises a rapid design service to produce custom fixed focus lenses that are fully optimised for the customer's needs.

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BEARINGS FOR WIND POWER

Improved run-in and wear



At this year's Hannover Messe, **NKE Austria GmbH** presents bearings for wind turbine gearboxes and generators. The Austrian bearing manufacturer has more than 20 years of experience in the wind energy sector. NKE

bearings have been installed in more than 4,000 wind turbines across Europe, the USA and China, equivalent to more than 10,000 MW of installed power. For example, NKE bearings are present in all bearing applications of the Envision gearbox: from the carrier (rotor side, generator side) to the high-speed shaft, including the intermediate shaft and planetary gearbox shafts. At the company headquarters in Steyr, Austria, NKE has established a competence centre for large bearings, including the most advanced production facilities and a logistics centre. All NKE bearings undergo strict, documented quality control procedures. Besides comprehensive technical consulting services, NKE's Application Engineering department offers support for obtaining certification to wind standards such as GL2010, IEC61400 or individual customer specifications. Besides bearings for wind power, NKE produces standard and special bearings for all industrial applications. Engineering, product development, production and final processing of components, assembly, quality assurance, logistics, and sales and marketing are centralized at its Steyr headquarters.

►► 63636 at www.ien.eu

150W & 200W DC/DC CONVERTERS

Come with a 12:1 ultra-wide input voltage range



The TEP 150UIR and TEP 200UIR from **Traco** are series of railway-certified DC/DC converters designed for highest reliability in the most demanding applications. Their ultra-wide 12:1 input voltage ranges allow the application engineer to target an array of nominal system voltages with a

single design. Thanks to their dedicated holdup capacitor connections, the TEP 150UIR and TEP 200UIR meet extended holdup-time requirements without the need for bulky input capacitors. Ultra-wide 12:1 input voltage range: 14-160 VDC. The TEP 150UIR and TEP 200UIR series are EN 50155 certified for applications on rolling stock. Additional certifications include EN 61373 for mechanical shock and vibration, EN 45545-2 for fire behavior and IEC/EN/UL 62368-1 for IT and general-purpose industrial applications. Fully encapsulated, they operate in temperatures from -40°C to +105°C. They have a remote on/off and trim function, comprise protection against short-circuit (SCP), overvoltage (OVP) and overtemperature (OTP), and include a 3-year product warranty.

►► 63635 at www.ien.eu

INTERNAL AND EXTERNAL SMART CONNECTOR

SCHURTER's first devices of the Smart Products range



The internal Smart Connector DS11 is an intelligent connector that can be installed as a power entry module in electronic devices and systems. Equipment and device manufacturers can thus offer their customers extensive additional functions in no time.

The DT31 is an external plug-and-play and retrofit smart connector. This connector variant can be connected to an existing device quickly and without installation. As users can link existing devices quickly and inexpensively with the pluggable DT31, it is ideal for monitoring the use and consumption of existing devices. In hospitals for example, technical staff can use the Smart Connector DT31 to precisely monitor the operating hours of existing medical devices and thus determine, how often the devices are in use. Both connectors of the new **SCHURTER** Smart Products range have a WLAN connection. The internal DS11 also has a serial interface for direct connection to the host device. Both Smart Connectors are IEC-60320 compatible. The intelligent Smart Connectors are part of a comprehensive, cloud-based software system. Users can access their Smart Products via the new Smart Ecosystem from SCHURTER. The Smart Products can be used to monitor the energy consumption of electronic devices and equipment. The planning of preventive maintenance intervals and the fleet management of electrical devices also become more efficient and easier with the intelligent new Smart Products.

►► 63637 at www.ien.eu

BDC SLOTTED MOTORS

Enhanced autoclavability for surgical applications



Portescap introduces the B2010A4 and B0810A1 brushless DC slotted motors as its two newest additions to their Surgical Motor Solutions portfolio. These motors are designed to withstand more than 1,000 autoclave and medical device dishwasher

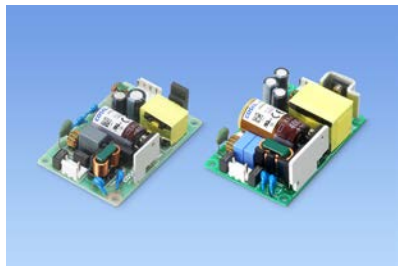
cycles. This is possible due to the improved encapsulation of the windings, which enhances the motors' autoclavability. The B2010A4 (Size 20) bone mill surgical gearmotor features a 50mm diameter, which is unique as such a sterilizable motor in such a large frame size. The motor's 6 poles and full metal gearhead allows it to achieve a high peak torque of 15Nm while simultaneously providing a continuous, slow rotation for bone mill and bone crusher devices. With a 20mm frame size, the B0810A1 (Size 8) multi-tools surgical motor fills the gap between Portescap's existing Size 6 and Size 9 SMS motors, making it an ideal choice for device miniaturization. The 4-pole design enables the Size 8 to provide 20% more torque than competitive solutions within the same package size, and its lightweight mass of 110 grams facilitates longer working times for surgical hand tools and decreased surgeon fatigue. Both the B2010A4 and B0810A1 provide much-needed design flexibility for those within the surgical application space.

►► 63641 at www.ien.eu



COMPACT 2"X3" POWER SUPPLY SERIES

Universal input range of 85 to 264VAC



COSEL Co, Ltd announced the expansion of its medical power offering with the addition of the new UMA series, the first two models being the 30W UMA30F and the 60W UMA60F. Both models

feature a universal input range of 85 to 264VAC and comply with international safety standards. Designed for demanding medical applications, the UMA series is suitable for Body Floating (BF) applications and complies with 2MOPP (IN/OUT) and 1MOPP (OUT/FG) safety requirement. Based on a robust platform, the units' design has been optimized to offer a very good price/performance ratio for medical applications requiring a high quality power solution. The UMA series is available in up to five output voltages of 5, 12, 15, 24, and 48VDC. The UMA series Complies with EN 60335 safety standard. Established in Japan 1969, COSEL is one of the world's leading designers and manufacturers of high performance AC-DC Power Supplies, DC-DC Converters and EMI Filters. Their product range is aimed mostly at demanding applications within the Industrial, Factory Automation, Medical, Telecoms, Lighting, Audio/Broadcast & Renewable Energy sectors with a flexible approach with full in-house design.

▶▶ 63657 at www.ien.eu

CURRENT SENSOR FOR TRACTION INVERTERS

Smallest of its kind and very small footprint



Measuring just 29mm x 21mm x 12mm and weighing 27g, **LEM's** new HSTDR current sensor is significantly more compact than a traditional C-core sensor, making it much easier to be integrated into space-limited inverter boxes. The sensor enables traction inverters to operate at maximum

efficiency by combining high accuracy with affordability and the ability to operate in demanding environments - the sensor has an operating range of -40°C to +125°C and is robust enough to cope with vibrations up to 10G. Using open loop Hall effect technology and an innovative magnetic core design, the HSTDR offers excellent immunity against external field and cross talk as well as consistent behaviour over frequency with little part-to-part phase shift dispersion, ensuring more accurate torque control. What makes the sensor unique is not only that it is 42% smaller than its predecessor (LEM's HSNDR) but also weighs 50% less and offers 50% greater measuring range, as well as best-in-class accuracy and a global error over temperature and lifetime below 3.5%. Giving EV manufacturers the choice of having different current measuring ranges in the same housing - from ±300 A up to ±1500 A - the sensor ensures galvanic separation between the primary circuit (high power) and the secondary circuit (electronic circuit), which is also suitable for 800V battery systems.

▶▶ 63720 at www.ien.eu



FREE DIGITAL SUBSCRIPTION

ROTARY SCREW AIR COMPRESSORS

More compressed air for less energy and CO₂ footprint



The CSD/CSDX range from **Kaeser Kompressoren** help reducing CO₂ footprint. The most important highlight of these compressors is their low energy consumption, which has been achieved via a number of

innovative measures. The CSD/CSDX model series has drives of the best possible efficiency class, whether speed-controlled (IE5) or fixed-speed (IE4). The centrepiece of all compressors in this series is the rotary screw airend with flow-optimised "Sigma Profile" rotors, specially developed for this performance range. These and numerous other improvements, such as speed-controlled fan motors, have enabled the energy efficiency of the compressor system to be enhanced, which has significantly reduced energy consumption, resulting in reduced energy costs and an improved CO₂ footprint. What's more, the new design has led to improved accessibility to all relevant components and therefore increased maintenance-friendliness. Featuring motors with power from 45 to 110 kW, models from this series can cover delivery volumes from 8.4 to 19.4 m³/min and are designed for pressures up to 15 bar. Particularly at low pressures, even higher delivery volumes can be achieved. The environmentally friendly system design also extends to the fluid filter elements: they are metal-free and after use can simply be thermally disposed of without need of further treatment.

▶▶ 63659 at www.ien.eu

OEM PRESSURE SENSOR

Designed for mobile working machines



Based on the MH-4, the MH-4-CAN from **Wika** is a powerful, reliable and extremely resilient pressure sensor for mobile working machines. Even under demanding conditions,

the sensor delivers constant, precise measured data and ensures high operational safety. The special feature of the MH-4-CAN is, as the name suggests, the CANopen or SAE J1939 serial interface. This enables use in complex machines and offers the advantage of simple and cost-effective system expansion with the bridging of large distances while simultaneously ensuring signal stability and signal integrity. The MH-4-CAN meets high demands and measures with high precision at temperatures between -40 and +100 °C. With its up to 3 times overload safety, the sensor withstands hydraulic pressure spikes - and is optionally available with a restrictor. Thanks to metallic shielding, the MH-4-CAN works interference-free at field strengths of up to 60 V/m. In addition, vibrations up to 40 g and shocks up to 100 g have no influence on the measurement quality. Founded in 1946, WIKA is today a strong partner for all the requirements of industrial measurement technology, thanks to a broad portfolio of high-precision instruments and comprehensive services.

▶▶ 63722 at www.ien.eu

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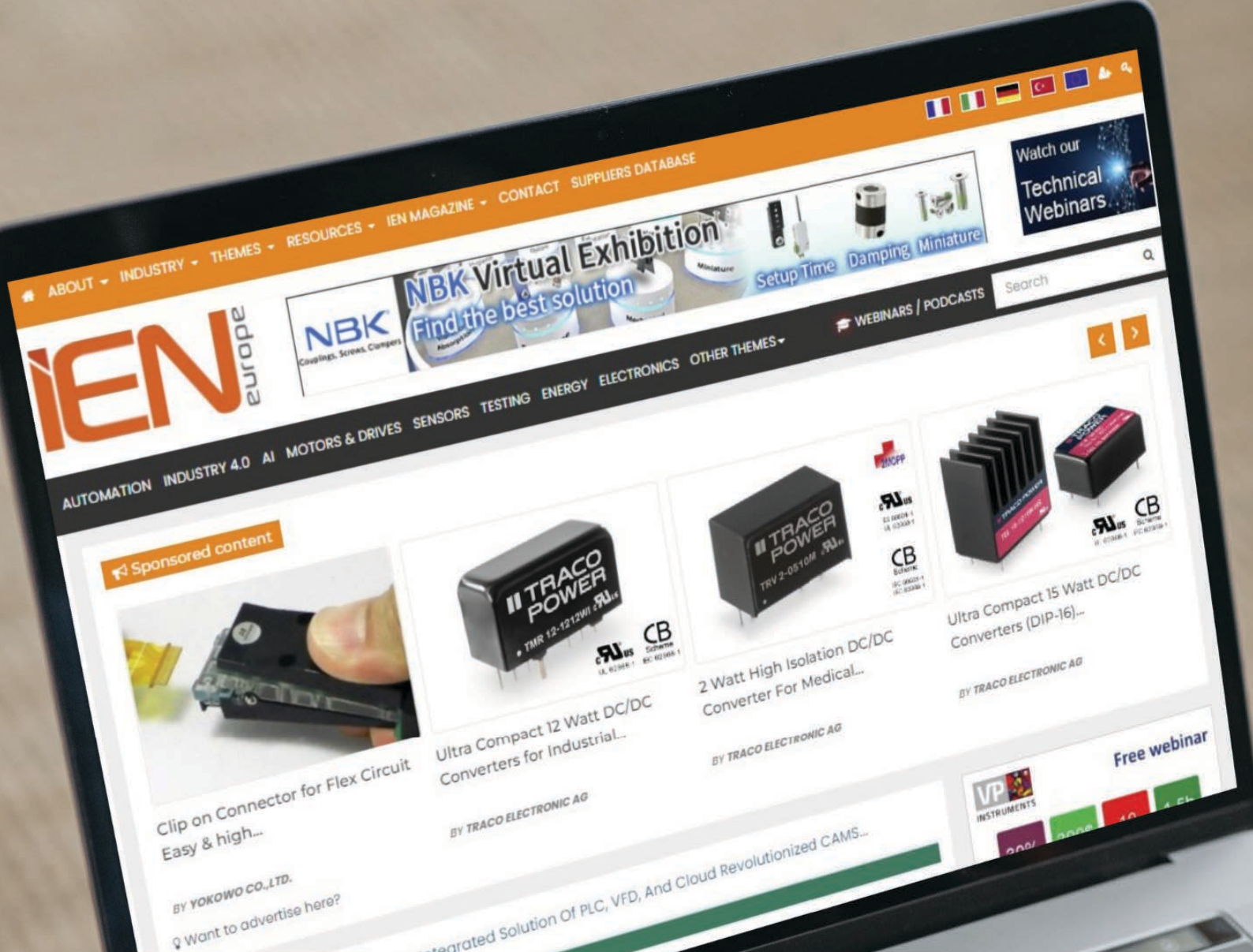
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