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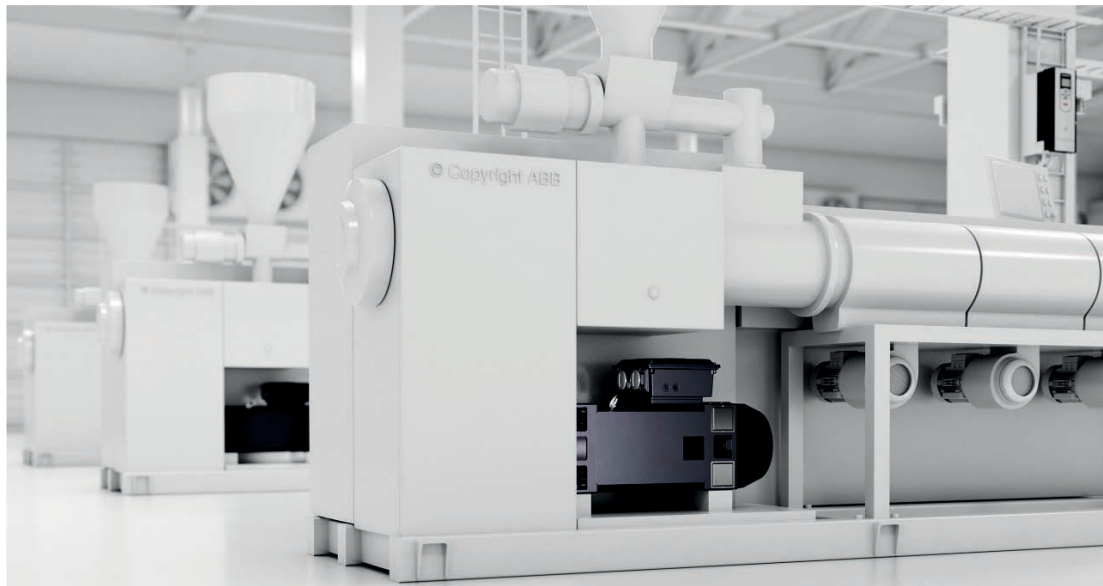


ABB has re-engineered its range of High Dynamic Performance (HDP)

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Industrial Engineering News

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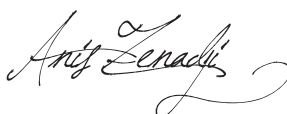
On March 8th, in light of Russia's invasion of Ukraine, the European Commission has proposed a plan to make Europe independent from Russian fossil fuels well before 2030, starting with gas. This plan also outlines a series of measures to respond to rising energy prices in Europe and to replenish gas stocks for next winter. For instance, the plan REPowerEU will seek to diversify gas supplies, speed up the roll-out of renewable gases and replace gas in heating and power generation. This can reduce EU demand for Russian gas by two thirds before the end of the year.

In the light of these considerations, IEN Europe proposes you p11 the outcomes of a report on why the transition to energy efficient and electrified buildings strengthens Europe's Economy. Electrifying and renovating European buildings could help cut Russian gas imports by roughly 25% within a decade and generate benefits for the economy, according to a new study by Cambridge Econometrics.

In this special issue dedicated to advanced automation, medical industry or linear motion technology, you will find out an interesting piece from Thomson on maximizing linear motion accuracy and durability with informed round shaft selection, helping you understanding shaft physical form factors.

Last, we invite you to take a look at our product review for Hannover Messe 2022, and at our two exclusive interview as well with key figures from Intel and the CLPA.

We wish you a pleasant and interesting reading



Editor for IEN Europe

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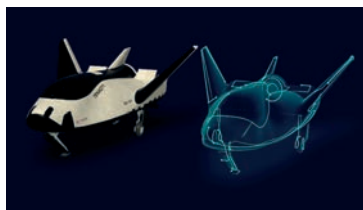
Sensor+Test

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Sierra Space to Revolutionize Space Exploration with Siemens' Xcelerator

Siemens Digital Industries Software announced that Sierra Space, a leading commercial space company at the forefront of creating and building the future of space transportation and infrastructure for Low Earth orbit (LEO) commercialization, has implemented Siemens' Xcelerator portfolio of software and services as the foundation of its next-generation digital engineering program. The company is implementing Xcelerator to establish a fully digital environment from engineering to manufacturing through sustainment, which will help realize goals to develop the future of space transportation, commercial space destination and infrastructure, and create enabling technologies that will build a growing and accessible commercial space economy. Sierra Space will use Siemens' Xcelerator in all phases of next-generation Dream Chaser® development, including structural, thermal, mechanical, electrical, and software design, vehicle manufacture, requirements verification and complete lifecycle maintenance. Sierra Space will be presenting at the 37th Space Symposium, Colorado Springs, Colorado, April 4 to 7 2022.



Mouser Electronics Sponsors FIRST Robotics Competition

Mouser Electronics, Inc. announced its continued sponsorship of FIRST® Robotics Competition, which inspires innovation and fosters well-rounded life capabilities in tens of thousands of young people every year. During the 2020 FIRST (For Inspiration and Recognition of Science and Technology) Robotics Competition season, nearly 100,000 high-school students on more than 3,900 teams from all over the world participated to learn, discover and solve engineering challenges through a series of virtual and live robotics events.



The global authorized distributor will be a major presenting co-sponsor of the FIRST in Texas/UIL State Robotics Championships,

planned for April 6–9 at the George R. Brown Convention Center in Houston, Texas. Mouser also supports FIRST teams in its community, providing grants for local high school teams. Analog Devices, Inc. also joined Mouser in the sponsorship. Each FIRST Robotics Competition team receives access to a Kit of Parts system — including motors, batteries, a control system, a PC and a mix of automation components — with limited instructions. In a set amount of time, teams transform these various parts into working robots designed to perform specific tasks.

BGEN awarded UK industry-first with Rockwell Automation

BGEN has been awarded a UK industry-first by Rockwell Automation, and is the first company to be approved to provide Rockwell IIoT platform integration in the UK. The approval gives BGEN certification to integrate Rockwell Automation's award-winning FactoryTalk® InnovationSuite, powered by PTC, including PTC ThingWorx. PTC ThingWorx simultaneously removes technical barriers to the IIoT implementation, while emphasizing practical solutions that quickly return value. BGEN secured the approved IIoT status following a rigorous capabilities check. The process included engineers achieving certification for PTC ThingWorx Fundamentals and PTC ThingWorx Professional, and successfully completing a project using the platform. BGEN has been using Rockwell Automation technology since 1998 and joined Rockwell's System Integrator Programme in 2003, achieving gold status when Rockwell updated its programme in 2021.



Robin Whitehead,
CEO at BGEN.

Ann Dunkin, CIO of US Department of Energy to Headline at IOT Solutions World

The IOT Solutions World Congress (IOTSWC), will feature Ann Dunkin, Chief Information Officer at the US Department of Energy as the featured plenary speaker for the 2022 edition. From May 10 to 12, the event will feature over 200 exhibitors and 250 experts taking the stage to speak on disruptive technologies and solutions that are transforming industries. Organized by Fira de Barcelona in partnership with the Industry IOT Consortium® (IIC™), the 2022 edition of IOTSWC will structure its congress program in five horizontal tracks aimed at providing a new cross-industry approach: Business Optimization Solutions, Artificial Intelligence Solutions, Connectivity Solutions, Security Solutions and Customer Experience Solutions. Ann Dunkin is author of Industrial Digital Transformation: Accelerate digital transformation with business optimization, AI, and Industry 4.0. She has experience both in the public and private sectors having served in the Obama Administration as CIO of the United States Environmental Protection Agency and as Chief Technology Officer and Strategist at Dell. Prior to that, she was the Chief Information Officer (CIO) for the County of Santa Clara, California.



5 Biggest Problems with Security, and How Zero Trust Can Fix It

According to a VMware Cybersecurity Threat Survey Report, the shift to remote work has led to a massive surge in the number of digital attacks experienced by more than 90% of organizations worldwide in the last couple of years.

As businesses continue to adopt coming-of-age hybrid cloud and storage environments, IT ecosystems too have evolved from old school and perimeter-based monolithic IT structures to more intricate multi-cloud and perimeter-free environments. These complex yet advanced IT ecosystems disperse connected devices, data and users across a gigantic network of workloads and applications.

With organizations responding to new social and business dynamics embracing new technologies, the need for next-gen and future-proof security approach was never this evident. IT security has always been based on perimeter defense framework, like the walled cities and fenced castles of the Middle Ages. The idea is to keep intruders at bay while assuming full trust on the ones inside the walls to roam freely. Unfortunately, the perimeter security concept has been under siege for several years now, thanks to the inflating networks of connected devices and mass adoption of remote work concept.

Evolving IT Systems and the need for Zero Trust security

As organizations get aboard the digital transformation wave while the diversity of security continues to inflate, new security models like Zero Trust are proving out as a boon in helping bring context and insight into the rapidly exploding attack surface. Businesses today need a security framework that is uncompromised and offers protection against new and coming-of-age threats including new strands of Ransomware, multi-prong attack tactics and social engineering hacks.

Lack of Security Intel

With remote work becoming the new normal, an

increasing number of organizations are resorting to the Internet of Things or IoT. According to the State of the Network Study report, more than 50% of IT experts had deployed IoT devices in 2021 owing to a range of benefits that these devices offer. For example, they help manufacturing companies monitor the performance and efficiency of industrial processes without the need of having the staff on site. These devices also provide health care personnel a means to track vital signs of patients in hospital or at home from a remote location.

Unfortunately, most organizations lack critical security insights into these connected devices. Part of the problem might be the startling fact that there's no one at the site to manage these devices. With more and more people working remotely, employers are paying less heed to their connected devices. Therefore, failing to monitor them for potential malware infections, security vulnerabilities and other security issues.

5 reasons businesses need to be conscious of Zero Trust security

1. How secure are your cloud-based business initiatives?

Last few years have witnessed a massive surge in the number of organizations jumping into the hybrid cloud ecosystem. Though hybrid and multi-cloud help an organization grow, compete effectively and transform operations, these benefits require a modernized and reimagined focus when we talk about enterprise security.

Zero Trust security acceleration services help to protect all your multi-cloud and hybrid cloud investments, bringing in a new and balanced set of policies, governance, configurations, controls and automation across users, data and diverse cloud workloads. It brings visibility and context

helping to maximize compliance while improving monitoring and reporting.

Zero Trust helps to achieve improved security and maturity model. It helps security professionals and IT teams follow a use case based framework to help mature existing or new security capabilities.

2. How strong is your data privacy control strategy?

Nothing is more important to a brand's reputation than keeping its customer data safe and confidential. Ensuring optimum data privacy is quintessential to build brand loyalty and trust. With businesses working in diverse and distributed ecosystems these days, security unarguably is the key focus.

Zero Trust assumes a no trust policy wherein every user, every connection and every device is verified rigorously. It helps to preserve customer data privacy, drive transparency and accountability across the organization with intelligent and risk-based authentication.

Zero Trust paves way for a proactive security approach helping businesses rethink their idea of data security while helping them meet data privacy requirements and regulations. Organizations can define a multi-disciplinary and strongly integrated security strategy using a Zero Trust framework.

3. How do you control access to customer data in your organization?

Protecting your customer data is essential for one big reason: your business relies on it. With the number of attacks increasing at lightning speed with no signs of slowing down, protecting customer data is more important than before.



Zero Trust IAM (Identity & Access Management) approach provides a powerful and modular IAM approach that leverages context and data – driven insights and analytics to decide who will get access to what and what they will do with it through a strong and intelligent multi-factor and risk-based authentication powered by Artificial Intelligence (AI).

What Zero Trust IAM offers:

- Mobile multi-factor authentication and risk-based access policies driven by AI
- Powerful control over digital identities and assets with identity federation
- Sound balance between security and usability
- Smarter and intelligent hybrid IAM approach

4. How good are you when it comes to detecting and tracking credential stuffing?

Credential stuffing is one of the most disturbing security vulnerabilities wherein hackers target networks of web infrastructure and breach into a user's accounts using stolen credentials. This not only harms a brand affecting its revenue, but also affects customer trust.

Employees' business accounts are doorways to an enterprise's data chamber and employee credentials are the keys to these chambers. Unfortunately, humans aren't that good in keeping the keys to these chambers safe thus, leaving the doors of chambers wide open for attackers.

Did you know?

According to FBI Security Advisory, hackers leveraged bulk loads of credentials to carry out fraudulent check withdrawals and ACH transfers amounting to \$3.5 million from a renowned fi-

nanacial organization.

Attackers unleash thousands of bots to execute commands to steal millions of customer data. This is the reason organizations need extra protection to keep identity and privileged access breaches and attacks at bay.

5. How do you secure and monitor a remote worker's access to your IT systems and networks?

As more and more companies adopt the remote work concept, employees are accessing mission-critical business data, networks, applications and other sensitive data from disparate sources, devices and networks. This has opened the doors to new security challenges, threats and vulnerabilities.

Zero Trust security helps an organization to better position itself to prevent breaches and attacks that may include stolen credentials, user impersonation, password reuse, credential stuffing, etc. Implementing a Zero Trust security approach can help businesses eliminate the standard and old school password protection method, which is a common cause of phishing attacks.

Zero Trust can protect the dispersed remote work ecosystem with real-time insights and threat intelligence.

Takeaway

Zero Trust security paves way for a proactive security architecture helping businesses to reimagine their approach to securing data. Old school incident respond techniques and approaches often leave IT and security teams




perplexed and overwhelmed when it comes to detect and prevent sophisticated attacks.

Zero Trust can easily adapt to the complex modern security and IT infrastructure, embrace hybrid and multi-cloud environment and protect data, devices, apps and people irrespective of where it stays or goes.

It helps businesses to simplify risk management by eradicating implicit trust concept. Irrespective of the situation, user, access method and user location, security takes a center seat with the most extreme, proven and tested security checks.

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Infrastructures in Manufacturing and Utilities are Ready for Digital

Following the last Intel Webinar on how to succeed business and security goals with AI, Sunita P Shenoy, Sr. Director, Product Management for Industrial Edge Computing Technology Platforms at Intel continued the discussion on how to increase manufacturing operational efficiency.

IEN Europe: Could you please introduce yourself and your role at Intel?

I am the Sr. Director of Product Management for Edge Computing Platforms in the Industrial Solutions Division within Intel. My organization is responsible for driving Industrial needs into Intel's Edge Products from Silicon to Software assets that enables an ecosystem of Edge Products.

Why are security and AI important nowadays and what do industrial solutions providers need to consider?

Mission critical Industrial infrastructures in manufacturing and utilities are ready for digital transformation with AI and Wireless Connectivity being the center of gravity. Intelligent Edge Computing is at the center of these transformations where data value is extracted, analyzed and actions applied real time. AI learning technologies are applied to extract the value of data and then AI inference technologies are applied to drive intelligent actions. Given the mission critical nature of Industrial infrastructures, cybercrimes can shut down the entire plant if security is not designed into the systems. Many governments are updating policies address cybersecurity for their critical infrastructures. Solution providers need to deliver products that have built-in security protocols and comply with Automation System standards such as IEC-62443.



Sunita P Shenoy, Sr. Director, Product Management for Industrial Edge Computing Technology Platforms

How to drive sustainability in business with AI and security?

Manufacturing is a high impact industry that accounts for 21% of direct carbon emission and 54% of the global electricity consumption, while consumers are becoming increasingly selective about sustainably made products. In addition to Intel's 2030 RISE strategy, Intel Industrial Solutions Division, and its partners leverage AI to create industrial solutions that reduces carbon emissions by modernization of the grids, increasing manufacturing operational efficiency, reducing waste, improving carbon capture, and improving security to reduce unscheduled down time and improve worker safety.

How can customers consistently maintain their security posture on an ongoing basis?

Customers must require solution providers to deliver products that have built-in security protocols and comply with Automation System standards such as IEC-62443.

What value are you bringing to customers?

Intel's value and role as a Technology leader to accelerate and enable the digital transformations. We have been accelerating transformation in the Industrial segments by:





- 1) Fostering a vibrant ecosystem of infrastructure, application, device, and solution providers enabled with Intel Silicon and Software products that have advanced AI and Security features. Intel has variety of Silicon products ranging from CPUs, GPUs, specialized AI accelerators, to FPGAs that can accelerate a wide variety of AI workloads with software development tools such as Open VINO.
- 2) Driving standards that are critical to drive Industrial 4.0 transformation. We are actively leading or participating in key standards bodies and consortiums from Open Process Automation Forum, Distributed Management Task Force, ANVU, 5G, etc. to drive open and interoperable systems.
- 3) Engaging with our end customers such as utility companies and factory owners to understand their challenges and helping them with their digital transformation initiatives along with our ecosystem of partner solutions

Could you tell us more about existing and further collaborations between Intel and their customers on AI and security?

We are working with several customers and ecosystem partners in deploying AI based solutions to address use cases such as Defect detection, Predictive analytics to prevent unplanned downtime. For example, working closely with Audi engineers and technicians, Intel created a scalable, flexible machine learning platform for Audi's auto-

mated factory. You can read more about AI based solutions on <https://www.intel.com/content/www/us/en/manufacturing/manufacturing-industrial-overview.html>

On security, Intel's Silicon products have built-in security technologies, and we are enabling our ecosystem solutions to leverage the security features on our products to harden their solutions.

Among you, what further developments will shape the future of security through AI?

Governments around the world are passing the Cybersecurity policies that require Automation systems to have built-in security postures. This space is still evolving and one to watch for future updates.

1. 54% of electricity consumption
<https://www.eia.gov/outlooks/ieo/pdf/industrial.pdf>

2. 21% of direct carbon emission
<https://blogs.garden.virginia.edu/innovation-climate/2018/12/13/decarbonizing-the-industrial-sector-a-long-road-for-low-carbon-manufacturing/>

<https://www.industrialtransformationnetwork.com/article/articles/how-industry-40-is-helping-manufacturers-reduce-carbon-emissions>

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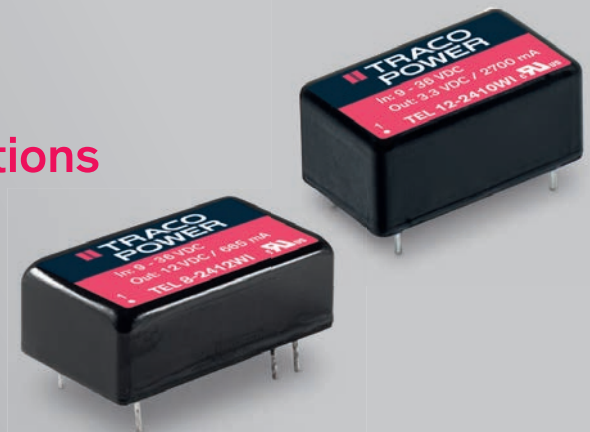
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TEL 8WI	8 Watt	9-36, 18-75 VDC	3.3-24 VDC	DIP-16	
TEL 10	10 Watt	9-18, 18-36, 36-75 VDC	3.3-24 VDC	DIP-16	
TEL 10WI	10 Watt	9-36, 18-75 VDC	3.3-24 VDC	DIP-16	
TEL 12	12 Watt	9-18, 18-36, 36-75 VDC	5-24 VDC	DIP-16	
TEL 12WI	12 Watt	9-36, 18-75 VDC	5-24 VDC	DIP-16	
Available soon	TEL 15WIN	15 Watt	9-36, 18-75 VDC	5.1-24 VDC	DIP-16

High Power Density Motors Create new Opportunities for Machine Builders

ABB has re-engineered its range of High Dynamic Performance (HDP) induction motors to offer frame sizes between 80 and 400 and output capacities up to 2 megawatts (MW).

HDP motors offer excellent dynamic response and high-power density. They're typically used in plastic and rubber extrusion, injection molding, winders, lifting, conveyors, test benches and machine tools.

Now, a new re-engineered generation of HDP motors has been introduced for machine builders. It offers frame sizes between 80 and 400, and output capacities up to 2 MW – as well as alternative variants such as high-speed and water-cooled motors. The motors are designed for use with a variable speed drive (VSD) and ABB can provide matching motor and VSD packages across the frame-size range. These motor-and-drive packages offer superior machine performance along with high energy efficiency.

Origin of HDP motors

To better understand HDP motors, it's useful to take a quick step back into history. Industrial machinery relied on DC motors in earlier days because of their exceptional speed control. However, with the advent of VSDs in the 1980s, it became possible to control the speed of the more powerful AC motors for improved performance and energy efficiency. Consequently, specialized AC motors with a square, cross-section frame design, such as ABB's HDP motors, slowly started replacing DC motors. These motors built on a classic technology advantage – market-leading power density – which enables a compact installation footprint.

Another important technical advantage is the motors' low rotor inertia. This enables faster reversing of the motor's rotational direction to speed up the machine's back-and-forth motion – a prerequisite for smooth and pre-

cise machine operation or maneuvering. This, together with the square frame design and a high overload capacity, gives HDP motors an excellent dynamic response. The motors can be equipped with a mechanical integrated holding brake or a wide variety of feedback devices.

Specialized AC motors, which are centered around simple induction technology, have proven more economical and service friendly than the previous DC motors. Today they dominate both the retrofitting and new machine design markets. Variations of HDP motors are now being designed specifically for industrial machine use, offering OEMs exceptional power density and a high-torque design.

The dual benefit of high-power density

Machine builders can capitalize on the high-power density of the HDP motors in two ways:

The first option is to retrofit an existing machine with a stronger drop-in replacement motor. For this, it's essential to match the frame size of the existing motor with the least possible engineering work. The superior power density of HDP drop-in replacement motors is their most significant value-added feature. Being more powerful will boost machine performance, thereby giving machine builders a strong competitive edge.

The second option is to select a more compact yet equally strong motor when designing a new machine type. Machine compactness is becoming an increasingly important product differentiator for machine builders and their customers, mainly because of floor space constraints. A motor's compactness can have a major influence on the compactness of the machine itself, depending on the machine's category and type.





OEMs can design more compact machines if they select a motor of a smaller frame in size but with a high-power density and a high-torque design. Although smaller, HDP motors produce the same output as the larger motors of the previous generation.

Design flexibility and customization

Beyond variable frame sizes, which help reduce overall machine footprint, OEMs can

also benefit from HDP motors' flexibility, thanks to the high-speed and water-cooled variants available.

This is why it's critical to select a motor that has flexibility and scalability intrinsically built into its design. A good example is to provide OEMs and end-users with programmable encoders to help them adapt to their changing needs without the burden of having to stock a set of encoders.

Straightforward installation

Ease of installation is typically a critical consideration. For instance, installing a replacement HDP motor into an existing machine is possible without excessive engineering work and can be done in minutes. Installation simplicity is visible in nearly every aspect – from easily accessible connection points to the simple installation of accessories such as cooling fans, encoders, and brakes. For example, the latest ABB motors have adjustable key components which allow flexible mounting of the terminal box, making it easier to connect cables where there are machine-specific space constraints.

It is also important to select motors that comply with the IEC 60034 standard, making them suitable for unrestricted global use. Machine builders also have access to all frame sizes, technology variants, and customizations. ABB's global services organization provides worldwide technical support to OEMs and end-users.

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Why the Transition to Energy Efficient and Electrified Buildings Strengthens Europe's Economy

The European Alliance to Save Energy communicated on report finds concluding that energy efficient and electrified buildings strengthens Europe's economy and energy security.



EUROPEAN ALLIANCE TO
SAVE ENERGY
Creating an Energy-Efficient Europe

Electrifying and renovating European buildings could help cut Russian gas imports by roughly 25% within a decade and generate benefits for the economy, according to a new study by Cambridge Econometrics.

The report "Modelling the socioeconomic impacts of zero carbon housing in Europe", commissioned by the European Climate Foundation and project-managed by the European Alliance to Save Energy (EU-ASE), explores various scenarios for reducing fossil fuel consumption in European residential buildings to hit the EU's climate goals¹.

According to the study, Europe can dramatically reduce its need to import gas from overseas by upgrading homes, while at the same

time create additional jobs and deliver socioeconomic benefits for European households.

"The safest and most climate-friendly energy is the one we do not use. Each 1% of energy efficiency leads to a 2.6% reduction in gas imports. The study's findings shows, once again, that prioritising energy efficiency renovations accelerates the integration of renewables and delivers multiple benefits, including increased Europe's energy security, to citizens,

businesses and the environment" commented Monica Frassoni, President, European Alliance to Save Energy.

By rolling out a wave of climate-friendly renovations and heat pumps in homes, Europe can save the equivalent of a quarter of current Russian gas imports by 2030². As a result, the annual spending on gas imports would go down by €15 billion within a decade and by €43 billion in 2050.

¹ Buildings are responsible for 40% of the EU's energy consumption and 36% of the EU's energy-related greenhouse gas emissions, because a large number of dwellings are energy inefficient and use fossil fuels for heating. To meet Europe's climate objectives, the building sector will need to fully decarbonise by 2050.

² This is equivalent to 1.45 EJ natural gas less imported in 2030 compared to 2022. In comparison, the EU imported ~5.5 EJ of natural gas in 2020 from Russia (Source: Eurostat).



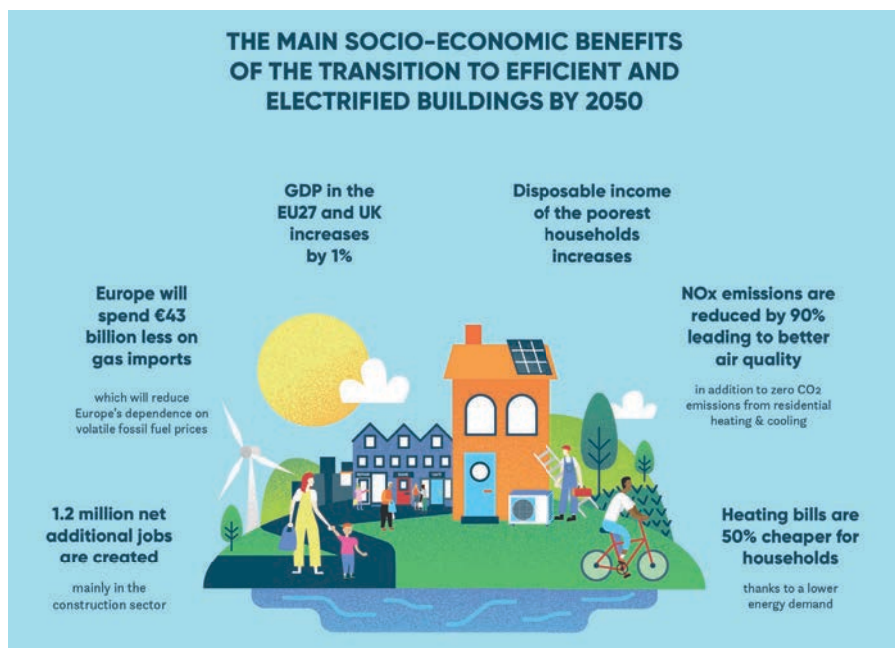


Main findings

The study shows that accelerating energy renovations and the uptake of heat pumps offers wider socio-economic benefits for Europe than using green hydrogen for heating. The transition to energy efficient and electrified buildings could³:

- Create around 1.2 million extra jobs by 2050, mostly in the construction and power sectors.
- Reduce NOx emissions by 90% by 2050, leading to better air quality.
- Increase the GDP in the EU-27 and the UK, equivalent to an additional 0.8% of annual GDP in 2030 and 1% in 2050.
- Reduce spending on gas imports equivalent to savings of €15 billion in 2030 and €43 billion in 2050.
- Halve consumers' heating bills by 2050.
- Increase disposable incomes for the lowest-income households as the switch to efficient heat pumps and homes will lead to lower energy bills.

Andrea Voigt, Head of Global Public Affairs, Danfoss Climate Solutions, commented: "The study clearly shows that energy renovations are essential to reduce buildings' energy needs, optimise consumption and accelerate the integration of solutions that decarbonize

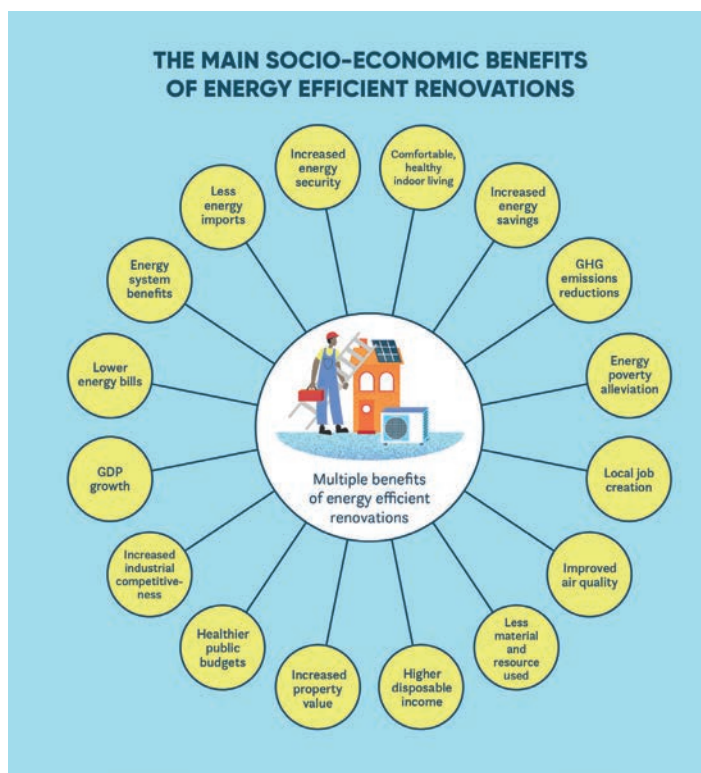


The main socio-economic benefits of the transition to efficient and electrified buildings by 2050

the building stock while reducing energy bills for users. The good thing is that such solutions are readily at hand! Very short-term, with immediate impact and ultra-short payback, such as room temperature controls.

From a more systemic perspective, heat pumps, for example, are a proven technology, which has already been available for decades. They provide huge benefits for individual heating but also when combined with district energy where they offer significant flexibility and thermal storage opportunities to facilitate the phase-out of fossil-fuels and move towards renewables. Mandatory heat maps for municipalities to assess the heat potential are crucial in that respect."

The main socio-economic benefits of energy efficient renovations



More information

- Read the summary report - "Building Europe's net-zero future: Why the transition to energy efficient and electrified buildings strengthens Europe's economy"⁴
- Read the full report - "Modelling the socio-economic impacts of zero carbon housing in Europe"⁵

►► 62209 at www.ien.eu

³ All numbers are compared to the baseline scenario

⁴ <https://europeanclimate.org/resources/renovating-and-electrifying-buildings-strengthens-europes-economy-and-energy-security/>

⁵ <https://www.camecon.com/what/our-work/european-climate-foundation-modelling-the-socioeconomic-impacts-of-zero-carbon-housing-in-europe/>



THREE-WAY MINIATURE SOLENOID VALVE

Expands flexibility in medical product design



Emerson's compact, configurable three-way valve offers new options for high-flow, precision gas control in oxygen therapy and analytical devices. The company has expanded its ASCO™ Series 090 line of miniature solenoid valves, adding a new three-way Series 090 valve configuration to enable lighter, more space-efficient solutions for gas control in oxygen therapy, compression therapy and gas analyzer devices. Originally developed as a two-way valve for air and inert gases in portable medical devices, the Series 090 valve features a compact architecture, small (10.8 millimeter) footprint and 50 million cycle life for maximum reliability. And, because the new three-way configuration of the Series 090 valve can perform the same mixing and diverting functions as a pair of two-way valves, it further simplifies the design of small, high-precision gas delivery systems for oxygen and other home-care devices. Like all Series 090 valves, the new three-way valve is built to maximize gas flow, with a flow-to-size ratio that is well suited to portable medical device applications. The valve body is molded from polybutylene terephthalate (PBT) plastic, with seals made of durable fluorocarbon (FKM) elastomer. The Series 090 actuator combines high reliability with low power consumption, so battery life and device longevity are maximized.

▶▶ 62207 at www.ien.eu

CUBE RACK READER

Used for Covid-19 Cryobox Tube Racks



Ziath reports on the widespread adoption of its DataPac™ Cube rack reader in Covid-19 testing labs for tracking of sample tubes cryogenically stored in cryoboxes. Keeping track of large numbers of Covid-19 RNA extraction samples can be an onerous task. Many labs around the world are using 2ml screw cap tubes with

2D-barcodes on the base for this work, including those laboratories equipped through the successful UN/IAEA supply program. Screw cap tubes with 2D barcodes are widely available from many different manufacturers and are supplied in cryoboxes which can hold eighty-one 2ml tubes or up to 100 smaller tubes in a 13 x 13cm square format. Performance optimised for this rack size - the DataPac™ Cube has pre-loaded sample management templates which can be selected for the 81-, 100-, 121- or 196-tube cryobox formats supplied by various manufacturers. Special pre-cut "masks" enable the DataPac™ Cube to firmly hold cryoboxes of different formats and from various suppliers, as these can sometimes differ slightly in their outer dimensions. Reading a full cryobox of 100 Covid-19 sample tubes and decoding their barcodes takes only 1 second for the full rack using Ziath's latest AI-powered DP5 software. The resultant Covid-19 sample tube barcodes are displayed in tabular format together with a useful image showing the successfully decoded tubes.

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FREE DIGITAL SUBSCRIPTION

RECYCLING END-OF-LIFE MED. COMPONENTS

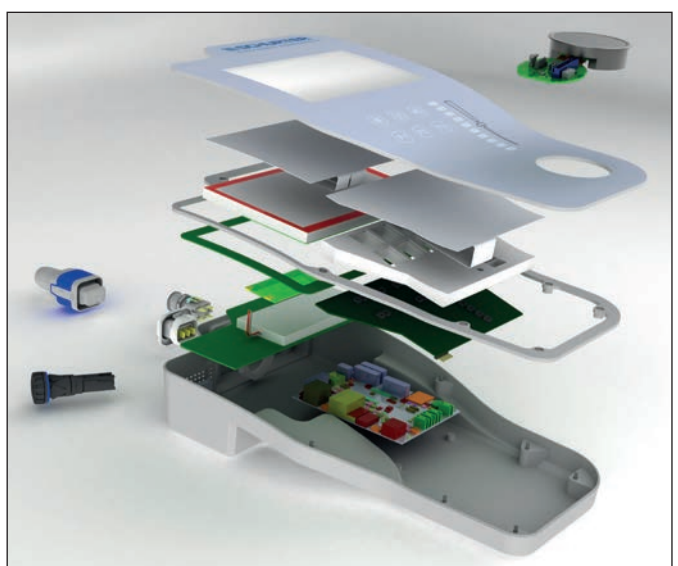
A sustainable initiative for Mitsubishi and Solvay



Medical equipment made using Solvay's Udel® high-performance polysulfone (PSU) thermoplastic will be recycled at the end of their useful lives in a new sustainability initiative that the

company has embarked on with **Mitsubishi Chemical Advanced Materials (MCAM)**. In line with Solvay's One Planet sustainability roadmap and Mitsubishi's KAITEKI vision designed to preserve resources and contribute to safer, cleaner and more sustainable products, both companies are currently investigating the implementation of logistics for recovery, recycling, and reprocessing of Udel® PSU medical components, with the aim of recycled material being suitable for reuse in the original applications. The project involves using a combination of the expertise developed by MCAM to wash and mechanically purify the material, together with Solvay's ability to evaluate the chemistry of the end-of-life polymer, to develop a robust recycling strategy that will provide customers with materials that fully meet all specifications. MCAM has already partnered with Solvay in reclamation and recycling of other high-performance polymers, including KetaSpire® polyetheretherketone (PEEK). Together with Solvay's polymer chemistry expertise, MCAM's mastery of mechanical recycling will help overcome the special challenges customers face to recycle and reuse such polymers in demanding applications in support of the circular economy.

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Growth strategies: Technical Innovation must not Overlook Business Innovation!

The factory of the future and industry 4.0 are new production paradigms that are too often regarded as mere technical innovations. However, their potential lies first and foremost in the new economic models that they help develop.

Industry 4.0 is part of a long-term transition from a property-based to a usage-based model. Manufacturing industry players are thus developing offers focused on service provision rather than product sales. Distribution and billing procedures for vehicles, machines, and also everyday consumer products, are changing profoundly.

For users, this model guarantees primarily a service as opposed to the supply of a tool: service is ensured in all circumstances, and in the event of interruption, it is the manufacturer's responsibility to oversee repair or replacement according to the terms and conditions stipulated contractually. On the financial level, it also represents a guarantee of control over the associated budget by minimizing risks: the cost of the service is known in advance and set for a fixed period. After that period, the user can choose to renew his commitment or not. In this manner, indebtedness is minimised without the constraints due to depreciation.

Customized services

The industry of the future is an industry that leverages data and uses it to develop new value proposals. By centralizing and exploiting product-related data, manufacturers have successfully developed innovative new services focused on their customers' needs. The Internet of Things, combined with product life cycle (PLM) solutions, is an opportunity for real-time monitoring of the data for each product throughout its lifetime, so as to personalise the service offered to every user. Whether it is sold as a product or offered as a service, the monitored item can be linked to services aiming at optimizing its performance according to each customer's usage: servicing, customisation, predictive maintenance, performance analysis, advice, etc.

Integrate the principles of a circular economy

The through-life monitoring of product-related data involves others benefits. It also enables manufacturers to take charge of new

aspects of production and in particular of the recycling, refurbishment, and upgrade part of raw materials, and even waste management. These are all examples of services inspired by the circular economy, that can help create value differently while drastically reducing the environmental impact of industry.

More flexible economic models in support of financial performance

Consequently, these new economic models offer key advantages to users, as well as from an environmental perspective, which explains both their commercial success and the enthusiasm they arouse in terms of CSR. However, in order to be viable, they must also act as drivers of growth for the manufacturers that implement them. Yet the customisation of products and services is also a singularly profitable commercial procedure. By diversifying company earnings, it also makes these companies less dependent on cycles of production and sales by creating a recurrent revenue base. Servicification also gives them an opportunity for accurate and real-time assessment of the margins obtained on each offer, and to select over time the most profitable approaches. Thanks to their greater flexibility, these marketing routes allow the commercial offer to be effortlessly tailored to market developments with a view to optimising the company's financial performance.

Olivier Heltterlin, VP Sales - France Benelux and Switzerland & Managing Director of PTC France

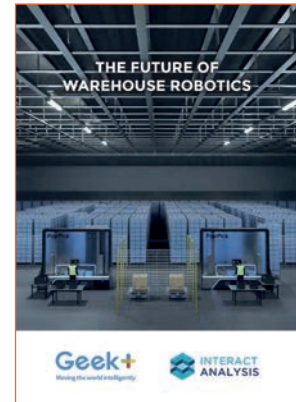
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The Future of Warehouse Robotics

Interact Analysis and Geek+. The pandemic meant warehouses had to cope with social distancing and staff absences. It also caused a massive e-commerce boost and has led to a protracted labor shortage. All this has forced warehouse managers to take a deeper look at the possibilities offered by warehouse automation and to accelerate any existing plans they had to automate. The goal is not only to improve the efficiency of their businesses in a newly competitive landscape, but also to boost staff retention by improving working lives. At the same time, the pandemic has highlighted that nothing is certain and that industries can be turned upside down overnight. Flexibility for operations and not being tied to major infrastructure for too long is of much greater importance. On top of COVID-related challenges, other major changes in the market are afoot too. These include so-called 'mass customization' which, for warehouses, means that the product lines they have to store and deliver are liable to change size and shape at short notice. As well as demands for ever more rapid delivery. An AMR solution usually presents several major benefits compared to fixed automation: it is cheaper, it is faster to deploy, it is more flexible, and it is easier to scale. New mobile robot solutions are enabling robots to select individual totes and bring them to pickers, instead of bringing whole racks, resulting in major efficiency improvements. Meanwhile, combining sophisticated software management systems with the wide variety of AMR platforms now available gives the option of knitting different robot types together into a single solution. Ultimately, this presents the possibility of a wholesale replacement of fixed automation solutions with mobile ones. Globally, the opportunity for warehouse automation is immense. Not least because of the huge growth in the numbers of warehouses. According to data from Interact Analysis, there were 150,000 warehouses around the world by the end of 2020. This will have grown to about 180,000 by 2025. To put it bluntly: if a team of well managed mobile robots can pick and carry any item to any location in a warehouse, why would anybody ever install a fixed conveyor belt ever again?



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All-in-one Software Solution

IXDen, a failure prediction and cybersecurity expert, has created an autonomous software that combines OT failure predictions and cybersecurity in a user-friendly, all-in-one solution. The IXDen solution analyses data from sensors and industrial equipment to spot anomalies in data transactions that signal a cyberattack or OT failure. IXDen's solution is a fully autonomous Machine Learning (ML) and AI software that creates a dynamic behavioural model of each device, both in isolation and as part of interrelated process dependencies. The software monitors 100 per cent of data transactions at the sensor level, spotting changes in behaviour that signal a cyberattack or equipment failure. The data is then used to summarise the OT health in a single numerical score, highlighted by a traffic light performance indicator, so operations managers can monitor the whole OT system at a glance, with the ability to drill down on the root causes of problems. IXDen's unique approach to IoT device security and authentication enables detecting security threats and abnormal behavior on all levels, from sensor and device to gateway, PLC and RTU. To detect even the slightest anomaly in the sensor data while protecting against tampering, IXDen implements unparallel Machine Learning and AI algorithms combined with proprietary mathematics, advanced behavioral and statistical modeling and analysis.



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TSN will play a key role along with gigabit bandwidth

Following the publication of a whitepaper on 'Getting your TSN product to market' in IEN Europe March, we interviewed John Browett, General Manager of the CC-Link Partner Association Europe, to follow the conversation on the current technologies and organizations using TSN.

John Browett has spent the last eleven years with the CC-Link Partner Association (CLPA) in Europe where he is now General Manager. In 2018, he oversaw the launch of CC-Link IE TSN in the European market, the first open industrial Ethernet to combine gigabit bandwidth with Time-Sensitive Networking (TSN).

IEN Europe: What is TSN and what does it involve?

TSN stands for Time-sensitive Networking. It is an update to the existing Ethernet specifications. It takes regular Ethernet and makes it deterministic. What that means is that things happen when you want them to happen, and when you expect them to happen. In the past, as far as being used in industrial automation, Ethernet did not have this ability. Since Ethernet was invented for the IT world originally, sending an email to somebody that arrives this minute or the next minute does not really matter. But when you're running high speed machinery, like on the packaging line, if things are not all tightly synchronized together and happen exactly when you plan them too, that can cause real problems. TSN allows you to forget about those problems, because it means that now Ethernet is deterministic and as a result we can use it much more easily for industrial automation now.

IEN Europe: Why is TSN important nowadays?

One example is Industry 4.0 becoming a key topic for manufacturing nowadays. Industry 4.0 depends on being able to move data and information around more easily and use that data to understand what's going on in the processes in a better way to manage them more effectively. TSN allows that to happen in a better way by providing what we call convergence. Convergence means that we can combine multiple types of traffic together onto a single network architecture. This is enabled by having the foundation of determinism that we talked about previously.

In the past, it might have been necessary to have multiple different kinds of networks to have different functions on machines and production lines. This made things more complicated because with multiple networks, you had more costs, more maintenance issues, and it was more difficult to combine what these were all doing together to understand what the big picture was. But now, with TSN allowing convergence, we can combine all that traffic together on one network and as a result, it makes it easier to have a comprehensive view of it. This acts



*John Browett,
General Manager of
the CC-Link Partner
Association Europe
(CLPA)*

as good support for Industry 4.0 as it is made easy to get data out of a system and process it into useful information, and then feed it back into a system to run it in the most optimum way.

IEN Europe: What benefits can it deliver to manufacturing?

There are probably four key benefits TSN can deliver. One of them is greater transparency and therefore better management of systems. The second one is the ability to have simpler network systems. Instead of needing multiple networks to do different functions, now we can combine everything together on one network. And that doesn't just apply to automation traffic. In the past, we already had industrial Ethernet technologies that could possibly combine for example motion control, safety, and normal general I/O, onto a single network. TSN allows these possibilities but can also combine it with normal TCP/IP traffic. For example, if you've got a video camera doing inspection processes, you can combine all that traffic together with it too. It is further simplifying things.

The third benefit is the convergence as said earlier. It also means that





it's now going to be easier to combine the operational technology area, such as the shop floor or the production lines, to the IT world. One of the key things that industry 4.0 is using these days is more cloud services in manufacturing. The ability to combine what's happening in the factory with what's happening in the IT world and in the cloud is a key benefit too.

Finally, and as a result, another benefit is that we can increase productivity, if you can run your processes in a more optimized and effective way.

IEN Europe: How can TSN-compatible products be developed?

There are a couple of different ways. First, you can develop a product by just using a software-based method. For companies who are looking to get a product to market quickly, that is a good option because in many situations they can take an existing product, which maybe already supports another kind of industrial Ethernet, and by changing the stack on that they could incorporate TSN connectivity. The other option, which maybe is perhaps a little bit more complicated, but may deliver higher levels of performance is to take a hardware-based approach. You can use dedicated ASICs to embed TSN functions and have everything implemented in hardware.

Another key point that goes along with those two is to also consider the bandwidth that you need to achieve for the product, how fast it can communicate on the network. And right now, I think 100 megabit is a well-established bandwidth figure for a lot of industrial automation. What we are seeing over the past few years and what's becoming more important now, as long with the demands of Industry 4.0 and the ability to handle more data, is that gigabit bandwidth becomes a lot more important now as more data needs to be handled and dealt with increasing bandwidth.

IEN Europe: What do automation vendors need to consider in order to create successful solutions?

First, the ability to implement TSN using hardware or software and different bandwidth options. Most vendors have a pretty broad product portfolio of different devices, with different functionalities. It is important to look at the existing portfolio that a vendor might have and decide, which of these products could we possibly update to support TSN in the future and along with that, they have their roadmap for future development. There are going to be new products that maybe haven't been developed yet or start development soon. Perhaps they are good candidates for supporting TSN from a hardware point of view and implementing it that way. No matter how you want to do it, what are your existing skills, platforms, and engineering methods. There is a range of different ways to implement TSN which pretty much suits almost any kind of product or any kind of vendors engineering processes.

IEN Europe: What organizations or companies have already developed products and solutions?

There is quite a lot of TSN products on the market already. One of the key vendors that are offering these kinds of products and solutions right now is Mitsubishi Electric. They offer very comprehensive solutions for various types of industrial automation and have been supporting TSN now for some time, all based on the CLPA technology CC-link

IE TSN. There are close to 100 products that all have TSN capability. There is also a lot of companies now getting into the TSN area like Moxa and Hirschmann/Belden who can offer various infrastructure products such as network switches. There are also companies like NXP semiconductor with various devices that will support TSN as so does Renesas for example.

IEN Europe: What further developments will shape the future of industrial connectivity in the industrial automation market?

If you look back 10-20 years ago, people would not have thought about the many enhancements happening in automation today. It is not completely certain what the future will hold but if we look into the crystal ball, there are some technologies that are already moving into industrial automation and are making a big impact. They include Artificial Intelligence, of course. It's getting quite common now to talk about AI and Machine Learning in various manufacturing processes.

Also making a big impact over the past few years are the various kinds of wireless technology, such as 5G technology. We're seeing a lot of big end users now who have started to implement private 5G networks in their facility to gain some benefits there especially for mobile machinery like AGVs. There are also Cloud services. We are seeing a lot of companies now starting to move some of their process infrastructure into the cloud. In the past you would have had local computing facilities to be doing the analysis of processes, or SCADA. A trend now to move into a cloud-based environment gives a greater ability for collaboration and sharing that data across different parts of an organization.

One of the things that goes along with that is edge computing that is showing a lot of promise for the future. There is the ability to have these nodes on the network, and they kind of act as filters in a way to do local processing of data. They then figure out what is the important matter and send the information to the cloud so that you can keep your processes running at maximum efficiency rather than trying to keep track of every tiny little piece of data that may not be as important as others. Combining all those technologies together will shape the further developments. Those interesting technologies are just starting to appear in manufacturing now, and I think they are going to continue to make a big impact as we move into the future.

IEN Europe: Do you have any other comment?

Yes, just one final comment. We have all these future technologies which are starting to make an impact. But I think that the key points, certainly from our point of view, is that all of these depend on data and the ability to be able to move data around in a real time predictable manner. This is why TSN will make a valuable contribution to all of these future activities. Because in the end, if you can't move your data around in a real time, predictable way, high performance manner, using gigabit bandwidth, then you're going to struggle to implement some of these technologies. TSN will play a key role, along with gigabit bandwidth in all these technologies as we move forward into the future.

Anis Zenadji

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Maximize Linear Motion Accuracy and Durability with Informed Round Shaft Selection

Linear motion designers often choose round rails over square rails to reduce costs in low-stress applications or when requiring high tolerance for misalignment. However, whether they achieve the intended benefit depends on how carefully they select from among the many available round rail shafting options.

While some may use a less expensive shaft with inferior characteristics, the modest savings in original shafting cost usually result in a decreased life. A basic understanding of crucial round shaft factors and how they influence precision and durability will be invaluable in helping you select the ideal shaft for your designs.

Understanding shaft physical form factors
Key shaft features that interact to impact precision and durability include hardness, straightness, surface finish, roundness and cylindricity.

Hardness

Shaft hardness affects the dynamic load rating of the bearing. Harder shaft surfaces better resist permanent deformation under single-point loading of bearing balls, thus maximising the life of the Linear Ball Bushing® Bearing and the rail itself.

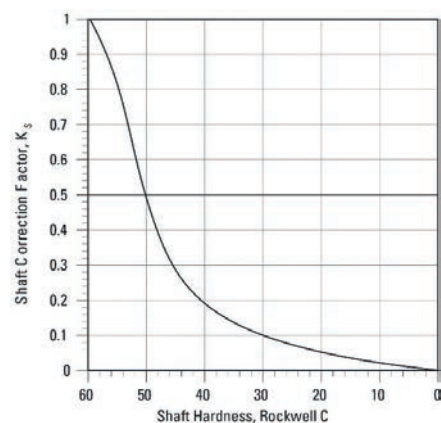


Figure 1: Shaft correction factor reduces dramatically as HRC hardness drops below 60. (Image courtesy of Thomson Industries, Inc.)

Figure 1 shows how the bearing load correction factor and life expectancy must be adjusted downward as hardness drops below 60 HRC.

The depth of the case hardness is another factor in determining overall life. Higher loads subject the shaft to deeper bearing ball penetration and higher stress concentration. High deformation resistance requires deep and uniform case hardness and must be engineered to Linear Ball Bushing Bearing size and load expectations. Best-in-class Thomson 60 Case® carbon steel shafts, for example, might have case hardness values ranging from 63-67 HRC and case depth of values of up to 2.54 mm depending on shaft size. Particular deep case (DC) options are available with case depths up to 6.35 mm helping to achieve longer life.

Straightness

The straighter the shaft, the higher the precision. Lack of straightness can cause binding, noise generation, premature wear and ball bearing failure. Best-in-class linear shafts

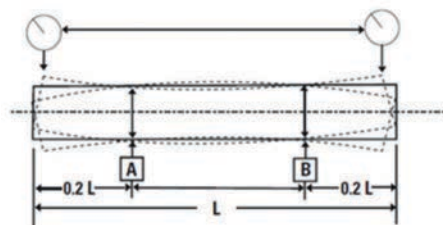


Figure 2: Shaft straightness is calculated as the difference between the minimum and maximum readout values along the length of a rotating shaft. (Image courtesy of Thomson Industries, Inc.)

are straight to within 0.0254 mm per 300 mm cumulative (0.0508 mm TIR). They can accommodate special straightness requirements of 0.0127 mm per 300 mm cumulative (0.0254 mm TIR) for critical, high-accuracy applications.

Surface finish

Surface finish (or RA for roughness average) is a measure of shaft smoothness. It represents the average height of the microscopic peaks and valleys along the length of the surface of the shaft. Superfinishing levels peak, producing plateaus. (Figure 3.) This increases the available surface area and distributes the load more uniformly. Surface finishing impacts Linear Ball Bushing Bearing travel smoothness and life, load levels and friction.

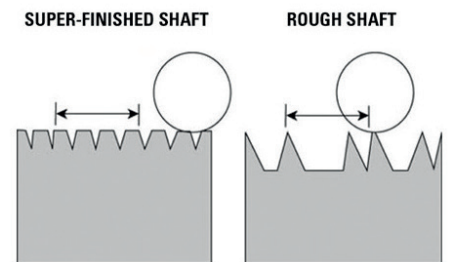


Figure 3: The super-finished shaft on the left results in smoother movement by increasing the percentage of shaft surface area on which the Linear Ball Bushing Bearings can ride. (Image courtesy of Thomson Industries, Inc.)

Roundness

The rounder the shaft, the more uniform the distribution of bearing loads and the longer the bearing travel life. Variations in shaft ra-



dii can cause rapid alternate loading. Shafts that are out of round by even 0.00254 mm can preload ball tracks, causing uneven wear, premature failure and can shorten bearing life by as much as 50%.

High precision applications require a roundness tolerance of 0.002032 mm, which manufacturers achieve by a process known as centerless grinding, as shown in Figure 4.

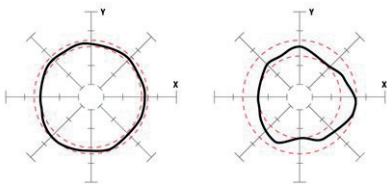


Figure 4. These two plots of shafts illustrate different roundness tolerances. On the left, a proprietary centerless grinding process produces shafts with a roundness tolerance of 0.002032 mm to ensure uniform distribution of bearing loads for maximised bearing travel life. Rounder = longer bearing life. (Image courtesy of Thomson Industries, Inc.)



Cylindricity

Cylindricity is a measure of the degree of conformance of the shaft (or linear race of the Linear Ball Bushing Bearing) outside surface to a true cylinder. High cylindricity ensures consistency of roundness and straightness along the entire length of the shaft – not just in a particular location. This ensures uniform load distribution, maximizing load capacity and travel life. High cylindricity equals higher precision, higher load capacity and longer life. Taper is a cylindricity measure of the change

in diameter any place along the length of the shaft. It subjects the bearing to shock and preload conditions and can cause one bearing to be loaded higher than another. Going in and out of a preloaded condition causes premature wear, which drastically reduces overall bearing life expectancy. For linear motion applications, look for shafts with a maximum taper of half the diameter tolerance over the length of the shaft. This ensures uniform distribution of bearing loads and maximises bearing travel life.



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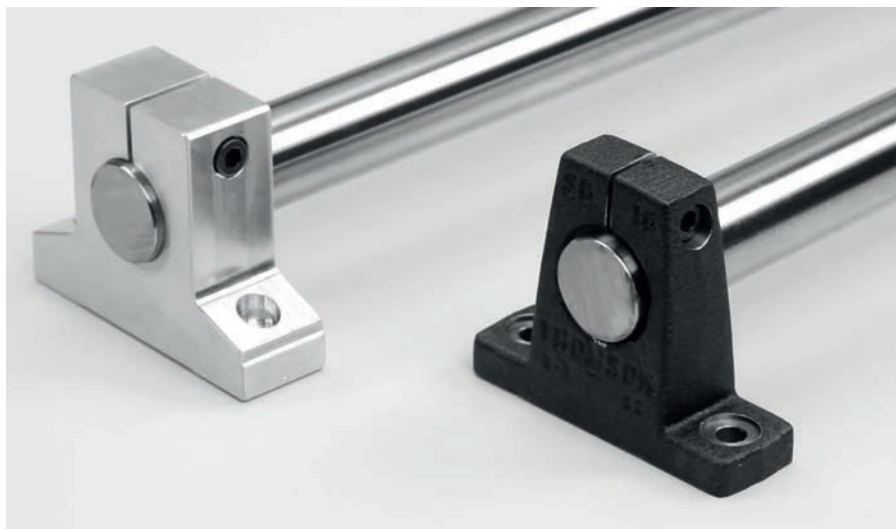


Electronic Digital Position Indicators

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- Quick and easy installation - no cables required
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Material matters

The most common materials used in shafts are carbon steel, 52100 tubular carbon steel, 440C stainless steel, 300 series stainless steel, and aluminum. Each has unique capabilities.

Carbon steel – Least expensive and most common, Offers the hardest and deepest case, with high tensile strength, but requires lubrication and not recommended for corrosive environments.

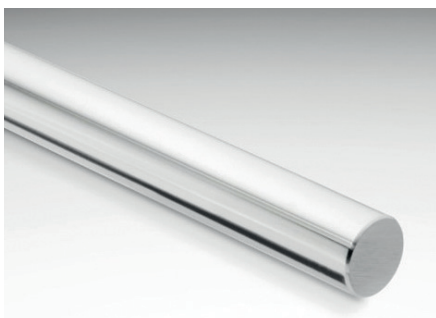


Figure 5: Carbon steel shafting is the most commonly used for linear motion applications. (Image courtesy of Thomson Industries, Inc.)

440C stainless steel – DIN EN X110Cr17 – Decent corrosion resistance and can be hardened for use with Linear Ball Bushing Bearings.

300 series stainless steel – DIN EN X8CrNiS18-9 -- A non-magnetic option, for

use with bearings can't be hardened. High sulfur content, gives high machineability but at the cost of corrosion resistance and toughness. Various grades offer trade-offs between corrosion resistance and machineability.

52100 tubular carbon steel– DIN EN 100Cr6

52100 tubular carbon steel provides a lighter shaft and a channel for routing fluids, lines or other components. (Figure 6) It is bearing-grade chromium steel with a carbon content that allows for good hardenability, with values in the range of 58 to 62 HRC.



Figure 6: Lighter weight and the ability to route fluids, lines or other components through the shaft make tubular carbon steel a popular option. (Image courtesy of Thomson Industries, Inc.)

Aluminum

Aluminum shafting usually comes with either a ceramic or hard-anodized coating. The coating hardness is nominal at surface level only. The shaft underneath the coating is soft and would deform at high point loading of a Linear Ball Bushing Bearing so it is not suitable for use with them. Weight reduction is significant compared to other shafting materials and corrosion resistance is good.

Plating extends life

The two most common plating options to reduce wear and increase corrosion resistance are hard chrome and Armoloy. Both are offered with a thickness near 0.00254 mm, increased hardness levels and long life but Armoloy has a higher hardness level of 78 HRC compared to a range of 65 to 72 HRC for hard chrome. Armoloy also adheres better to the base metal, which helps prevent chipping, cracking, flaking or peeling.

Help is available

Having an informed understanding of the factors that impact precision and durability will help designers make the optimal shafting choices for their applications. Understanding the characteristics of the production processes and material qualities, will have the greatest impact of the choice of materials, but depending on applications mounting, support and configuration may also play significantly. Increasingly, motion control vendors are providing [sizing and selection tools](#) that enable designers to easily enter specifications and receive recommendations immediately.

*Eduard Schweinfurt, Product Line Manager
EMEA & ASIA – Screws, LB&G and Screw
Jacks, Thomson Neff Industries GmbH.*

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MMW 5G CHIPSET

Enables simpler and smaller radios



Analog Devices, Inc. introduced a millimeter wave (mmW) 5G front-end chipset that addresses required frequency bands enabling designers to reduce complexity and bring smaller and more versatile radios to market faster. The chipset comprises four highly integrated ICs and provides a complete solution to significantly

reduce the number of components needed for 24 to 47GHz 5G radios. As mmW 5G deployment accelerates globally, operators are facing greater pressure to reduce rollout costs while expanding their network footprint with more energy efficient, lightweight, and reliable radios. This requires highly linear, compact, and power efficient wideband products that allow design reuse over multiple bands without compromising on quality and performance. The ADI mmW 5G front-end chipset allows OEMs to depart from the narrowband paradigm where competing solutions have traded-off design execution difficulty and radio frequency (RF) performance for bandwidth, while also outsourcing critical pieces of intellectual property such as packaging, test, and thermal modeling. The new chipset comprises two single channel (1T1R) up/downconverters (UDCs) and two dual polarization 16-channel beamformer devices on an advanced CMOS process.

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For industrial & medical applications (300 Watt)



The TPI 300 (industrial grade) & TPP 300 (medical grade) series from **Traco Power** are a set of encapsulated AC/DC power supplies coming as open frame and encased versions. They feature a reinforced double I/O isolation (3000 VAC) system according to

latest medical or industrial safety standards respectively. With focus on the medical market the TPP series also has a low leakage current of <math><100 \mu A</math> which makes the units suitable for BF (body floating) applications. The excellent efficiency of up to 93% allows a high power-density and compact design (4" x 2" for open frame and 4.6" x 2.44" for encased version). The operating temperature range is -40°C to +85°C with derating above 50°C. In natural convection operation these power supplies deliver 180 Watt going up to 300 Watt with forced air cooling. Additionally, they can deliver 360 Watt peak power for 5s. The EMC characteristic is dedicated for applications in industrial and medical fields. High reliability is provided by using high quality components and an excellent thermal management making the TPI 300 & TPP 300 an ideal solution for industrial and medical devices and for demanding safety and space critical applications.

▶▶ 62232 at www.ien.eu

MORE ENERGY EFFICIENCY IN ENCLOSURE VENTILATION

The new line of **DC roof exhaust units** offers high airflow performance and the power scalability according to the cooling needs, with clear energy savings.

**An effective solution
with low environmental impact.**

▶▶ 62036 at www.ien.eu

SMART COBOT

World first cobot plastic gearbox



With the ReBeL, **igus** is relying entirely on its motion plastics expertise: plastic makes the robot, whose net weight is 8.2 kilogrammes, the lightest service robot

with cobot function in its class. Without exception, igus develops and manufactures all mechanical components that make up the ReBeL. Its payload is 2 kilogrammes and its reach amounts to 664 millimetres. Repeatability is +/-1 millimetre at seven picks per minute. At its core is the world's first industrial-grade cobot gearbox made of plastic. "Behind these numbers are 1,041 tests conducted in our in-house laboratory since 2019, including tribological and thermodynamic tests on 15 material combinations and tolerance chains. A particularly great challenge was the heat generation in the fully integrated strain wave gear units, which are thermally influenced by the motor. In the development phase, we therefore also focussed on larger motors and better efficiency to significantly reduce heat generation", says Alexander Mühlens, Head of the Low Cost Automation Business Unit at igus. "This enabled us to improve continuously and ultimately quintuple the number of cycles to two million, which is equivalent to a normal service life of two years."

▶▶ 62214 at www.ien.eu

AI IN REAL TIME

Boosts the performance of machines and systems



With the acquisition of the software company Resolto, **Festo** has access to competencies in advanced analytics and artificial intelligence. The software solution Festo AX builds on the combination of these three

pillars. "It helps our customers to make decisions on the basis of facts," emphasises digitalisation expert Niese. Festo Automation Experience (Festo AX) is an easy-to-use solution that allows users to extract maximum value from the data produced by their equipment through artificial intelligence (AI) and machine learning. Users can increase productivity, reduce energy costs, avoid quality losses, optimise their shop floor and create new business models just by analysing their data with Festo AX. Festo AX analyses live data in real time. It can be integrated flexibly into the customer's system - on premises, on edge or in the cloud. The solution is capable of using the customer's own expertise according to the principle of "human in the loop". The user themselves and no one else remains the owner of the collected data. The data analysis is not just limited to components and modules from Festo itself. "A big advantage on the market is that our software also makes it possible to reliably analyse components from other manufacturers," stresses digitalisation expert Niese.

▶▶ 62216 at www.ien.eu

CONNECTIVITY SOLUTIONS

Resource-saving and highly efficient



"Digitisation and sustainability are not only the major buzzwords of this year's fair but are also two of the guiding principles of the way we think and

act," as Christopher Ukatz, Managing Director of **HARTING Deutschland GmbH**, stated during the presentation at the digital HANNOVER MESSE preview. The technology group summarises this concept under the term of "Connectivity+". This is all about factoring in societal megatrends: Sustainability, (de)globalisation and demographic change, as well as deriving the relevant technology: Modularisation, autonomy and digital twins. Under the umbrella term Connectivity+, products, solutions, services and applications are presented that are aligned with technological and social megatrends and thereby provide answers to the challenges of the future. The fact that this is not a theoretical construct makes the added value focus for customers all the more clearer. "In the development of Connectivity+ the collaboration and co-creation with customers and partners represents a tremendously important consideration," as Ukatz went on to outline. This is why a Communication and Innovation Center will feature at this year's HARTING trade fair stand. The focus here is on joint brainstorming, dialoguing, and exchanging ideas on the connectivity of the future.

▶▶ 62215 at www.ien.eu

POWERFUL ROBOTICS

For near-human tasks



Robots mowing lawns is a form of robotic assistance to which society has gotten used. But there are currently few concepts for robotic assistance in other tasks, which involve close proximity to humans, like housekeeping and care. The **Fraunhofer Institute for Machine Tools and Forming Technology IWU** uses innovative switchable stiffnesses in robots to combine the required strength with the necessary safety. Shown at the Hannover Messe Preview on March 16, 2022 and at the

Hannover Messe from May 30 to June 2, 2022, the researchers will be presenting a robot arm that could facilitate the support of people in their direct surroundings. The goal that researchers at Fraunhofer IWU have set themselves is to drive robotics forward in areas involving close proximity to humans. "Robots for use in close proximity to humans generate very different requirements from those used in industry, where workers can be trained in a specific way," says Linda Weisheit, Topic manager for the field "Robotics for Humans" at Fraunhofer IWU. "If robots are going to be used in everyday life, first of all they need to be safe and second of all, they must have an appropriate appearance that increases acceptance." While humanoid robots are desirable in Japan, Europeans tend to find similarities to humans disconcerting. The researchers are therefore keeping a steady eye on the design side.

▶▶ 62217 at www.ien.eu



MONITORING INTERFACE

For Ethernet analysis



PROCENTEC is taking diagnostics to the next level. The new EtherTAP monitoring interface is the bridge to the Osiris functionality on our portable Mercury tablet and permanent Atlas module. Both

devices run on diagnostics platform Osiris to analyse the information feed from the EtherTAP. This enables our build-in assistant Delphi to come up with a solution to help you to quickly and effectively get your operations running again. EtherTAP enables passive diagnostics, cycle time per device, and positive and negative message jitter. It has a number of dropped packets and alarm triggers. Select 'Ethernet' as the protocol to view the Ethernet statistics. These statistics are collected by the EtherTAP of the link it is currently monitoring. It is possible to analyze the amount of Network load and communication errors happening on the Ethernet link with the timestamp of the last change. The EtherTAP has a Port A and Port B, which are separately listed, each with their individual statistics. PROFINET devices send data on a very periodic basis, these are called cycle times. Cycle times are defined in milliseconds. Dropped packets are PROFINET messages which were missing in the communication cycle. Healthy PROFINET networks should never drop messages, too many consecutive dropped packets can cause the stop of the network. PROFINET alarms are specific error messages sent by the controller or the devices using the PROFINET protocol.

▶▶ 62218 at www.iem.eu

ACCELERATION SENSORS

Detects acceleration in three dimensions



The VSM type acceleration sensors from **ifm** can detect changes in vibration on the x, y and z axis. This spatial perception simplifies machine condition monitoring

where forces and unbalances not only affect just one axis of motion, as is the case with motors and moving parts of the installation. The acceleration signal plays an important role in machine and plant condition monitoring. It is an indicator of various symptoms, such as unbalance, damaged bearings or crashes that may lead to machine failure or even irreparable damage. The detected raw data is transferred for further evaluation to an external device, such as the VSE diagnostic electronics from ifm. The acceleration sensors are based on a MEMS chip (capacitive measuring principle) and designed for demanding industrial applications. Thanks to MEMS technology, the sensor's proper functioning can be checked actively via the diagnostic electronics (self-test). The sensor transmits its data according to the IEPD signal, which is a standard on the market, e.g. for acceleration sensors. The advantage of IEPD devices is a constantly high sensitivity irrespective of the type of the connection cable or its length.

▶▶ 62220 at www.iem.eu



FREE DIGITAL SUBSCRIPTION

SOLUTIONS FOR THE FOOD INDUSTRY

Optimized from a hygiene perspective



The food and packaging industry, and the robotics industry, are two sectors with a high global demand for innovative solutions, and will be the main focus of **Schaeffler**'s attention at this year's

Hannover Messe. As Ralf Moseberg, head of the Industrial Automation business unit at Schaeffler, emphasized, the food and packaging industry is currently caught up in a maelstrom of sustainability, lower production costs, and strict hygiene guidelines. Schaeffler will be presenting its new food-based product range in Hanover, as well as demonstrating ways of solving the aforementioned challenges faced by the industry using automation solutions which have been derived in practice. Ralf Moseberg and his employees view "sustainable engineering" as a major instigator in reducing energy and raw material consumption, while simultaneously securing considerable benefits for the customer. Designers and developers are encouraged to conduct more extensive analyses of existing solutions with regard to the use of resources, durability and wear, and operating costs, and to look for alternatives. Examples of how digitalization and sustainability can be combined to ideal effect in everyday operations will also be demonstrated in Hanover.

▶▶ 62219 at www.iem.eu

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▶▶ 61682 at www.iem.eu

P5 PROTECTION RELAYS

For demanding medium-voltage applications



Schneider Electric's Easergy P5 is a protection relay for demanding medium-voltage applications. It offers modern digital operation and best-in-class safety, security, reliability, and connectivity. These Medium Voltage protection relays have a focus on safety and cybersecurity. Easy to use for panel builders, system integrators and

end users. From overcurrent to differential protection with arc flash protection, LPCTs, LPVTs, redundant Ethernet communication and IEC 61850. With Easergy P5, advanced reliability meets future proof design built upon proven functionality. It is easy to install, configure and expand, or retrofit, including an innovative withdrawable design with backup memory that allows you to get operations running again in just ten minutes after maintenance. It provides users industry-leading dedicated protection relay functionality to reduce risks, improve reliability, all with advanced connectivity. Additionally, it can be used with a range of digital tools that make everyday operations simpler for users. The Easergy P5 is part of the PowerLogic range of power monitoring and control solutions and has been built on more than 100 years of experience in protection relays, including Sepam, MiCOM, and Vamp ranges, renowned for their reliability and performance.

► 62221 at www.ien.eu

I/O SYSTEM ADVANCED

For modern mechanical engineering



The new **Wago PFC200** Controller links the many possibilities of PFC technology with the I/O System Advanced. "Time-Sensitive Networking" (TSN) is the forward-looking technology for end-to-end, flexible, powerful and secure networking of machines and systems. The I/O System Advanced, Wago's brand new "made for TSN" automation solution, allows you to raise your

industrial automation to a new level. The PFC200 Controller is an open, innovative and future-proof automation system for mechanical engineering. The I/O System Advanced combines the proven benefits and functionality of the 750 Series with outstanding performance and an ergonomic mechanical design that help prevent errors. It features performance, short reaction times and a high level of synchronicity for the connection to various fast ETHERNET fieldbuses. Used for optimal automation both inside and outside the control cabinet: the flexible IP20 and IP67 remote I/O systems are designed for all applications and environments. This compact PLC for the modular WAGO I/O System. Besides network and fieldbus interfaces, the controller supports all digital, analog and specialty modules found within the 750/753 Series. Two ETHERNET interfaces and an integrated switch enable line topology wiring. An integrated Webserver provides user configuration options, while displaying PFC200 status information.

► 62223 at www.ien.eu

3-D SENSOR SERIES

3-D vision data for controlling different applications



SmartRunner Explorer 3-D from **Pepperl+Fuchs** includes two device variants with their own measurement methods on one platform: Stereo Vision and Time-of-Flight. Housed in the same housing, with uniform user software and data output,

the integration effort for 3-D applications can be significantly reduced. The stereo vision device has a range of one meter and a resolution of 1.4 megapixels. The size of the detection area is 400 x 350 mm at a distance of 600 mm and 550 x 500 mm at a distance of 900 mm. With these parameters, it is optimized for the high-precision detection of objects in this close range and is particularly suitable for inspection applications. For example, it can be used for checking and counting of defined objects or for volume acquisition. The additional depth information in the z-direction opens up completely new application possibilities that remain closed with conventional sensors. The device works with two cameras. Using the high-resolution 2-D data, the sensor can be precisely aligned with the target object, which makes it easier to interpret the measurement results. In the first step, your 2-D images are automatically superimposed to form a disparity image, which forms the basis of the 3-D point cloud. It should also be mentioned that all devices are factory calibrated.

► 62222 at www.ien.eu

POWER AND CONTROL CABLES

Withstand expanded ambient temperatures



ÖLFLEX® from **LAPP** is used in machinery, machine tools, system and appliance engineering, measuring, control, heating and air conditioning technologies. It can be used in harsh

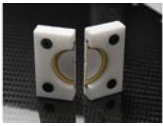
conditions in servo applications, power chain applications, special applications, or conveyor technology. It withstands expanded ambient temperatures. LAPP has also developed the online configurator ÖLFLEX CONNECT CHAIN: it will take only few clicks to engineer a power chain online. The configurator automatically switches off all error sources and finds the best solution. ÖLFLEX CONNECT CHAIN acts as a step-by-step guide through the choice of cable chain, cables and relevant accessories. It makes sure that components are compatible every step of the way, especially when it comes to the cables' minimum bend radius. The cable chain must not have a smaller bend radius than the cable. If this is the case, the configurator will display a warning message and suggest other types of cable chain. Other criteria include the travel length, acceleration, temperature behaviour and shielding. The configurator automatically excludes cables that are not suitable for the application. If required, it can position separators and shelves and makes sure that the weight of the cables is evenly distributed in the power chain.

► 62224 at www.ien.eu



ACTUATORS FOR ACTIVE FLOW CONTROL

Use micro fabricated valves to switch the flow



The **Fraunhofer ENAS** develops various fluidic actuators for the active flow control. Therefore performance requirements of the partners are considered on the one hand and new concepts are developed on the

other hand to make the actuators more compact, efficient and capable of being integrated. During the development two different streams are pursued: on one hand actuators without compressed air supply, which are called Synthetic Jet Actuators (SJA), and on the other hand actors, which switch the compressed-air systematically, so-called Pulsed Jet Actuators (PJA). In the aviation industry Synthetic Jet Actuators (SJA) are known for some years for Active Flow Control (AFC). A Synthetic Jet Actuator is a resonant electro-acoustic / electro-fluidic drive in a compact design with low power consumption. At an effectively net zero mass flow it generates a pulse greater than zero. Important characteristics of the actuators are the resonance frequency, the exit velocity and the flow of volume or mass. To optimize the SJAs for specific applications, it is necessary to completely describe the actuators. According to a SJA concept, which was newly developed by Fraunhofer ENAS, and in contrast to the conventional SJAs, a Helmholtz resonator is equipped with two membrane converters that are attached to its side walls to increase the efficiency of the actuators. For this construction new models need to be developed for the optimization.

▶▶ 62225 at www.ien.eu

SOFTWARE FOR THE DIGITAL ENTERPRISE

For aerospace, automotive or industrial machinery



Xcelerator from **Siemens Digital Industries Software** is a comprehensive, integrated portfolio of software, services and an application development platform.

Siemens' software solutions support an array of engineering disciplines, such as mechanical, electronics or software design tools, simulation environments and manufacturing operations planning and management solutions. At Hannover Messe they will highlight 3 out of their range of supported industries: Aerospace, Automotive and Industrial Machinery. Aerospace: Siemens provide industry specific solutions to complex business problems and focus on the five major functional areas in any program: Program Management, Engineering, Supply Chain, Production, and Product Support. Automotive: Siemens provides specific industry solutions to support the transportation revolutions like Autonomous Vehicle Development, Vehicle Electrification, Software and Systems Engineering, Accelerated Product Development, Smart Manufacturing and IoT&Analytics. Industrial Machinery: We combine our in-depth industry knowledge, with the Xcelerator portfolio. Siemens is able to create specific industrial machinery solutions that can provide an unstoppable advantage. These include: Advanced Machine Engineering, Intelligent Performance Engineering, Digital Part Production, Smart Manufacturing and Service Lifecycle and Analytics.

▶▶ 62227 at www.ien.eu

AUTONOMOUS TRANSPORT SYSTEM

Safe and robust navigation in mixed operation

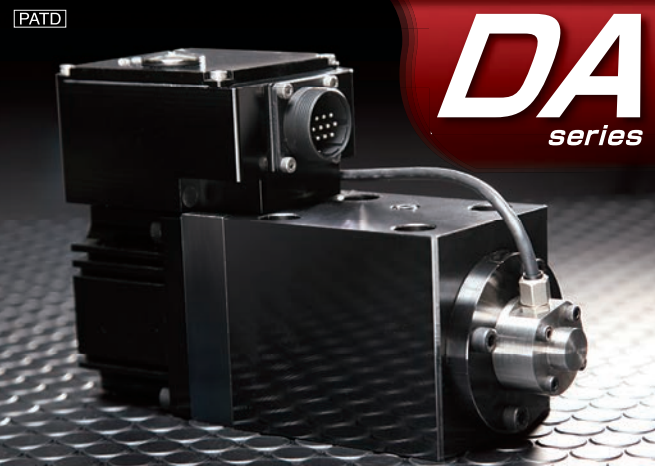


The ActiveShuttle autonomous transport system from **Bosch Rexroth** is already making the transition to the factory of the future possible today. It transports dollies that are loaded with Small Load Carriers (SLC) through the factory with a high degree of flexibility and safety. The dollies are loaded and unloaded fully automatically with the help

of an integrated lifting platform that takes into account the logistical requirements. In addition, the ActiveShuttle can be used to implement a wide range of transport concepts - from cyclic transports to consumption-based material supply. The autonomous transport system can be quickly and easily integrated into intralogistics via Plug & Go, without having to adapt the factory's existing infrastructure. The certified safety laser scanners in conjunction with the ActiveShuttle Management System ensure completely safe and robust navigation in mixed operation. Even when other transport vehicles are in use at the same time and when people are present, the vehicle fits seamlessly into the busy intralogistics environment. Changes in the transport environment are not a problem for the ActiveShuttle thanks to automatic map updates. Transportation has already been extensively tested in eight plants.

▶▶ 62226 at www.ien.eu

Direct Acting High-Speed Servo Valve



We are glad to offer our unique high-speed Servo Valve, employing "dual halbach magnet array" which reinforces magnetic fields for driving a voice coil having differential moving coils, as a result higher response and surpassing anti-contamination characteristics can be obtained.

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- high speed response of spool by non-contact detecting system of displacement and velocity

Typical Performances

Supply Pressure : 35 MPa, Rated Flow : 60LPM at ΔP 7MPa, Rated spool displacement : ±1.0mm

(1) Frequency Response (with oil bath) 800HZ : GAIN-3db, phase delay 90° (Spool amplitude : ±10%)

(2) Step Response (dry type) settling time 1.5 msec for 0-100% spool displacement



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FREE DIGITAL SUBSCRIPTION

How a Raspberry Pi Becomes an Industrial PC

Kay Petermann from IEN D-A-CH met Dr. Michael Kleiner, VP Engineering at the industrial PC specialist OnLogic, and talked about a new development based on the Raspberry Pi

IEN D-A-CH: Can you briefly give our readers some information about the company's development and product portfolio?

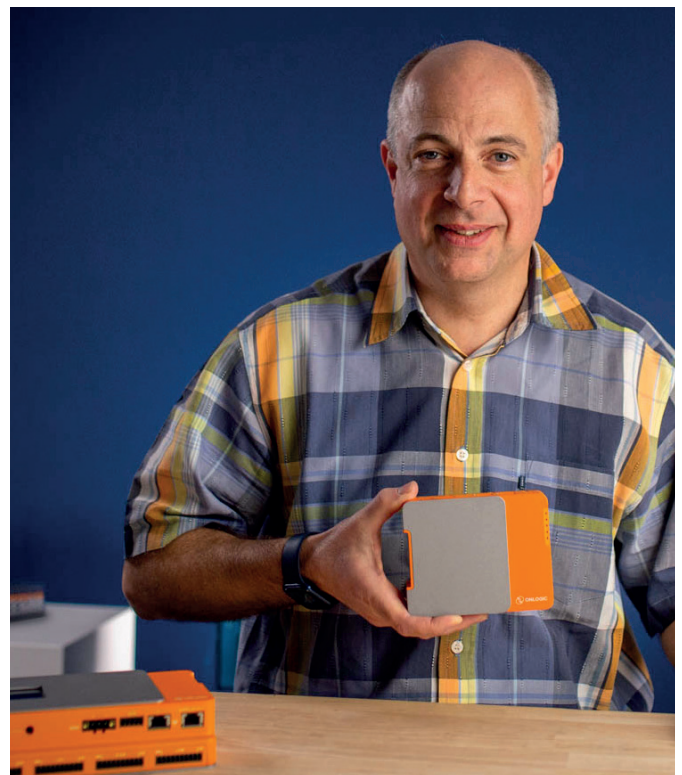
OnLogic began developing and manufacturing industrial computer hardware shortly after our founding in 2003. We specialize in small form factor, fanless systems that are built to survive where other computers would fail. Our customers around the world include the most well known innovators and industry leaders in manufacturing, energy management, smart agriculture, smart city technology, logistics, transportation, and automation of every kind.

Our computers range from palm-sized IoT gateways and ultra-reliable rugged devices, to touchscreen HMIs and advanced edge servers. Our mission is to help our customers solve their most complex technology challenges with high quality hardware. We do that through a combination of leading edge technology, in-house industry expertise and partnerships with leading software companies. We have been serving the entire European market from our European Headquarters located in the Netherlands since 2011, which allows us to offer more localized support and faster shipping to our German customers. We continue to see renowned German customers already finding us when looking for solutions to their technology challenges. As such, we've been expanding our German market presence and growing our German team of hardware specialists.

You are currently preparing the product launch of your IPC solution based on the Raspberry Pi 4. Which of the Raspberry Pi's features qualify it for this demanding field of application?

Our upcoming Factor 201 is an industrial computing solution based on the industrial-grade Raspberry Pi CM4 module. For the majority of our industrial customers, mounting a standard Raspberry Pi in a consumer-grade case isn't going to be sufficient to ensure long-term reliability and project success. We've taken the Raspberry Pi Compute Module 4, which has the same computing power as the Raspberry Pi 4, but none of the I/O, and combined it with our own carrier board and a custom-designed industrial chassis to provide a truly IPC-grade solution. The development and customization capabilities of the CM4, along with our carrier board allow us to offer industry-targeted I/O connectivity and features.

Raspberry Pi computing is desirable in the industrial space due to its economy of cost and low power consumption. There are other inex-



pensive solutions on the market, however Raspberry Pi benefits from their passionate community of developers who have created extensive documentation and proven the platform's capability through real-world implementations in industrial applications. We're excited to provide that community of creatives with a truly industrial platform to work with.

Which changes and modifications do you implement to ensure long-term capability in the application?

Here at OnLogic we're known for our fanless and ventless industrial computers. We're applying our years of experience and knowledge in the form of our carrier board and industrial chassis to help unleash the potential of Raspberry Pi for industrial use.

Starting from the outside, the chassis is both fanless and ventless to avoid the ingress of dust and debris which can be common in an in-



dustrial environment. We accomplish this through the latest evolution of our Hardshell™ fanless technology. The aluminum body panel improves the rigidity of the structure of the device while transferring heat directly from the internal components to the outside of the chassis without a fan. Moving parts are a common point of failure and can compromise the thermal management of the entire system in the event of a fan failure. That's why the Factor 201 is a completely solid-state device with no moving parts to wear down over time. Finally, we integrated a DIN Rail mount directly to the chassis to provide ease of installation in embedded applications. Inside of the Factor 201, the Raspberry Pi CM4 module is mated with our custom carrier board. The system supports up to 8 GB of memory and 2 TB of storage along with optional features including Wi-Fi, 4G LTE with provisions for future 5G support, and TPM 2.0 for added security. The Factor 201 is able to operate reliably in temperatures ranging from -20° to 60°C, while providing the connectivity our customers need, including a pair of 1 GbE LAN ports, one USB 3.2 port, two USB 2.0 ports, one HDMI port, one USB-C port (for OTG), and an RS-232/422/485 terminal block. We'll also offer the ability to power the entire system via POE-PD - meaning some applications will only require a single cable for installation and operation.

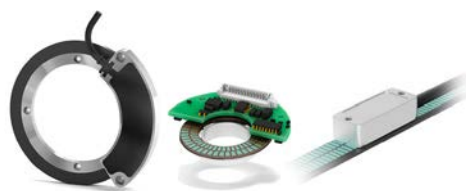


Since the suitable, feature-rich software and also its user-friendliness is becoming more and more important as an interface to the operator/user, how do you assess the software supply for the industrial area?

The wide variety of software already available for use with Raspberry Pi was one of the reasons we were excited to develop an industrial product on this particular ARM architecture. Software plays a critical role in the processes our hardware solutions enable. We value software so much that we partner with industry leaders such as IGEL, AWS, and Inductive Automation to verify compatibility with our hardware and pre-image their software on our systems before shipping. We've already been in touch with Inductive Automation to add our Raspberry Pi powered computer to their Ignition Edge Onboard program shortly after initial release. We see the affordability and flexibility of the Factor 201, as well as future CM4-based solutions, enabling our software partners to provide a cost-effective industrial computing solution to our mutual customers.

MODULAR ENCODERS FOR ROBOTS & MOTORS

Compact & lightweight



Lika Electronic offers a complete range of modular encoders and magnetic rings as well. Compact, lightweight, and

capable of high resolution and accuracy, encoders are ideally suited for integration into robotic applications such as robotic joints and motors. The wide variety of mechanical and electrical options can also be customized. Among the available solutions are SMAR and SMAB, they both offer off-axis installation. SMAR has frameless design while SMAB is fully encapsulated with IP69K protection. They are paired with rings having shaft diameters from 14 to 80 mm. SMA3 is the most recent encoder solution. It is equipped with Multiple Pitch Technology, i.e. it is able to adapt the dimension of the magnetic pole to the size of the circumference of any custom ring. It can be paired with rings up to over 6 m in diameter and has a resolution down to 0.29 μm. Lika also designs and manufactures a huge variety of rings, segmented rings, arcs, and curved structures complete with magnetic tape. Dimensions, materials, and mounting methods can be evaluated from time to time in order to fit each application exactly. These encoders fit the use for applications where a high functional safety level is required, for example in industrial collaborative robots.

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Where do you see the development and distribution for the industrial Raspberry Pi in the coming years? Where will be the primary fields of application?

We expect Raspberry Pi, and other ARM based processing platforms, continuing their current trajectory of high growth in the near future - especially in data collection applications that have traditionally been home to PLCs and RTUs. It's exciting to think about how much refinement of processes will be possible when basic data collection points can be replaced with connected hardware capable of intelligent data handling. Many of our clients are creating, implementing or retrofitting full-facility solutions, and the Factor 201, as well as our upcoming Factor 202 and the other ARM-based gateways we expect to offer in the future, can be used from everything to tracking incoming raw materials and providing work instructions, to warehouse management for finished goods or tracking and control of automated guided vehicles in a warehouse. The small size and customization capabilities of Raspberry Pi makes the applications virtually limitless. Raspberry Pi's lower cost and power efficiency, combined with the

Material shortages in a wide range of different areas, including electronic components and chips, are unfortunately a major issue in all industrial sectors at the moment. How do the shortages affect the availability of your products at the moment? How do you assess the general prospects for short- and medium-term development in this area?

Supply chain challenges have been very real in recent years, however our customers still need hardware solutions to continue to move their businesses forward. We faced the challenge head-on and have taken a very proactive approach. Though this has been, and continues to be a massive lift, it has enabled us to ship products when many of our competitors couldn't and has been a key contributor to our continued growth. We've worked hard to maintain close alignment of our sales, product management, supply chain, and engineering teams to identify available system configurations capable of meeting our customers' needs. We've found our customers appreciate the transparency and access to our hardware experts. We also credit our amazing supply chain team, including the team in our Taiwan office who are in constant communication with our vendors and always looking for the most efficient ways to get our clients the systems they need.

Our partnerships have been equally as important in overcoming materials challenges. Our partners and suppliers have enabled us to continue on our growth trajectory even during this period of component availability challenges. Partnerships also provide us with transparency on development roadmaps and allow us to align to industry trends - influencing our future development and letting us set a clear roadmap, both internally and with our customers.

Kay Petermann, IEN D-A-CH

» 62205 at www.ien.eu



OPC UA SERVER & MQTT PUBLISHER GATEWAY

For Modbus TCP controllers



Softing presents its uaGate MB as a gateway for Modbus TCP controllers, for example from Schneider Electric, Wago, Beckhoff or Phoenix Contact. Many

other manufacturers also offer Modbus TCP as an open communication interface. The gateway has an integrated OPC UA server for simple and secure data connection of new and existing systems to higher-level management systems, such as ERP, MES or SCADA systems. In addition, uaGate MB also offers MQTT Publisher functionality, enabling direct integration of PLC data into private or public IoT cloud applications on the IT side. The generic MQTT implementation supports the use of a large number of different cloud providers. Similar to the OPC UA standard, MQTT also supports various security mechanisms such as encrypted connections, certificates and user authentication, thus contributing to a high level of data security. With this functionality, uaGate MB is a compact, secure, future-oriented and proven gateway for data integration. The access to field data and routing through firewalls is made easy. The uaGate MB is especially dedicated to retrofit upgrades, thus protecting former investments. There is no need for software updates, operating system patches and PC updates resulting in years of failure-free operation. The PLC programming is minimal for register setup required.

►► 62228 at www.ien.eu

GROUND CAST SENSOR

Actionable observations for winter maintenance



Vaisala launches Wx Horizon Premium and a cutting-edge Ground Cast Sensor, delivering world-class actionable observations and insights for winter maintenance. Driven by Vaisala's newest IoT offering, Wx Horizon Premium is the

latest subscription tier of its weather hazard information system for winter road maintenance organizations. Vaisala's new Ground Cast Sensor is automatically integrated to Wx Horizon Premium which fuses local observation data with two of Vaisala's industry-leading modelling systems: its best-in-class road weather model and a weather forecasting system that improves global weather forecasts specifically designed for use in transportation. Wx Horizon Premium brings affordable, proactive winter treatment planning to all, enabling: Advanced planning of resources: 72-hour pavement forecast along with 10-day atmospheric forecasting; Peace of mind: built-in alerting and automated notification services remove the burden of continuous monitoring; Point forecast data where it's needed most: user-defined virtual forecast points matched to operational needs; Seamless integration with Vaisala's road sensors: accurate local measurement data improves forecasting and empowers decision-makers. The new Vaisala Ground Cast Sensor measures road temperature and the amount of treatment materials with the same performance as Vaisala's industry-leading road weather stations.

►► 62230 at www.ien.eu



FREE DIGITAL SUBSCRIPTION

HIGH PRECISION TORQUE MEASUREMENT

Extremely accurate and overload resistant



XtreMA 2.0 is a torque measurement tool from **Manner**. Due to the overload design of 400%, the torque sensor offers both the measurement of continuous loads and the short-term detection of load peaks in dynamic operation.

The special short design with the low rotor weight and the extremely low mass moment of inertia allow nominal speeds of up to 30,000 min⁻¹ to be achieved without any problems. Optionally, the flanges can be operated in the temperature range of -40°C... 160°C. Another special feature is the electronic compensation of the zero point error Tk0 and the gradient error TkC. This makes it possible to achieve constant high accuracy regardless of the ambient temperature. This is because which test stand is operated under constant operating conditions? The DIN flange pattern used, which is compatible with HBM torque sensors, allows easy integration into new test stands, but also into those already built with existing infrastructure - a retrofit. The field-proven flange pattern of all measuring ranges is retained. The XtreMA torque series includes the ranges of 50 N·m, 100 N·m, 200 N·m, 500 N·m, 1 kN·m, 2 kN·m, 3 kN·m, 5 kN·m and 10 kN·m. A stator unit in tube design allows, in addition to the classic analogue signals with 0... ±10V / 4...20mA or the frequency output, also an output of digital signals via EtherCAT, CAN, Ethernet or USB.

►► 62229 at www.ien.eu

AI CONTROLLED CHEMICAL PLANT

The plant runned for 35 consecutive days



Putting into practical use a next-generation control technology that takes into account quality,

yield, energy saving, and sudden disturbances, **Yokogawa** and JSR announce the successful conclusion of a field test in which AI was used to autonomously run a chemical plant for 35 days, a world first. This test confirmed that reinforcement learning AI can be safely applied in an actual plant, and demonstrated that this technology can control operations that have been beyond the capabilities of existing control methods (PID control/APC) and have up to now necessitated the manual operation of control valves based on the judgements of plant personnel. The initiative described here was selected for the 2020 Projects for the Promotion of Advanced Industrial Safety subsidy program of the Japanese Ministry of Economy, Trade and Industry. Control in the process industries spans a broad range of fields, from oil refining and petrochemicals to high-performance chemicals, fiber, steel, pharmaceuticals, foodstuffs, and water. All of these entail chemical reactions and other elements that require an extremely high level of reliability. In this field test, the AI solution successfully dealt with the complex conditions needed to ensure product quality and maintain liquids in the distillation column at an appropriate level while making maximum possible use of waste heat as a heat source.

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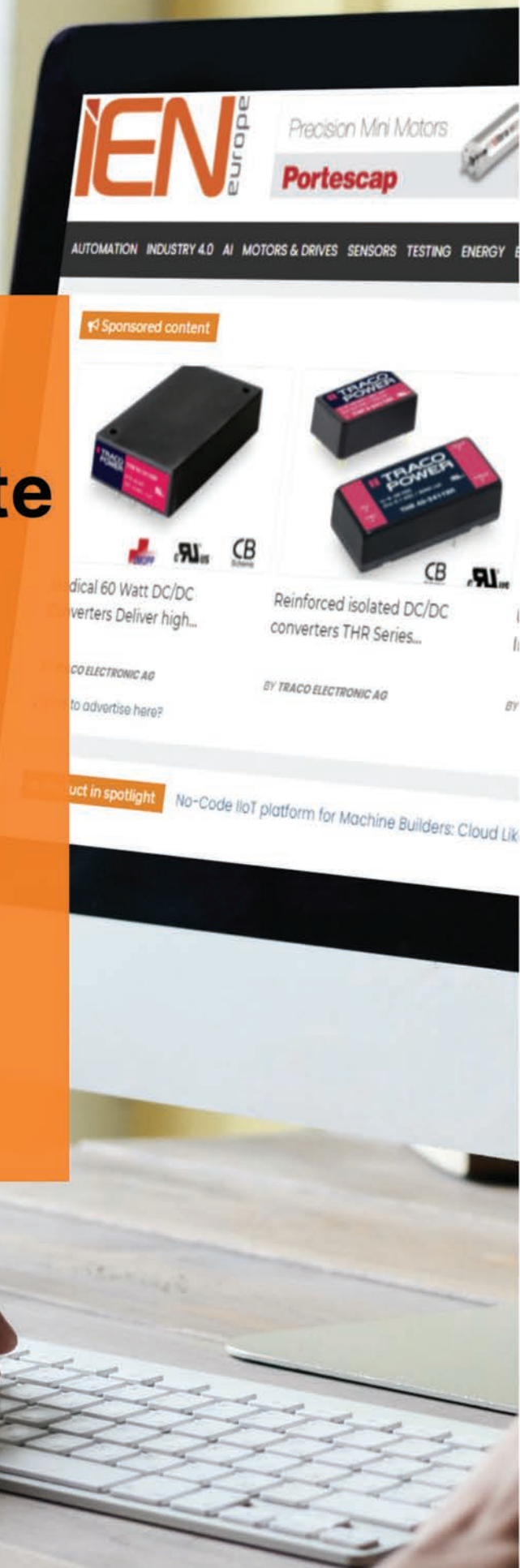
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