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Marco Prinari - m.prinari@tim-europe.com**FREE DIGITAL SUBSCRIPTION**Anis Zenadji
a.zenadji@tim-europe.com**Dear Readers,**

The journey through Digital Transformation never ends with a whole batch of industry news, product descriptions, an exclusive interview, and specialist articles to shed light on the key topics we discuss in this magazine: 5G Technology, IT/OT Integration, Digital Transformation, Cybersecurity, 3D Printing & Additive Manufacturing and a special AI IEN on Robotics.

This magazine is a bit special since it includes an 8-page supplement on the benefits of Time-sensitive Networking to the industries. This insert follows the 12-pages supplement that has been published in IEN Europe April 2022. You can also continue discovering the topic with an interview of John Browett, CLPA, on iен.eu.

Furthermore, in the exclusive interview with Hubertus von Monschaw, Global Director for HANNOVER MESSE, Deutsche Messe AG, we discuss the outcomes of the previous fair that followed the pandemic break, as well as some insights on this year's partner country: Indonesia.

The experts at 3DS DELMIA, part of the Dassault Systèmes Group, will bring you to take a closer look on the Virtual Twin experience. Digital Twin technology has quickly become a staple with many of the largest manufacturers in the automotive and industrial engineering sector around the world thanks to its ability to provide huge amounts of value in saving time and optimizing plant effectiveness. We wish you an interesting and pleasant reading.

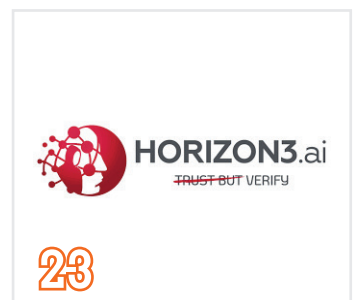
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In the next issue:

Special: Hannover Messe, Advanced Automation, Motion and Drives, Cables & Energy Chains, Energy Efficiency Business & Industry (EEBI), Energy Shortages

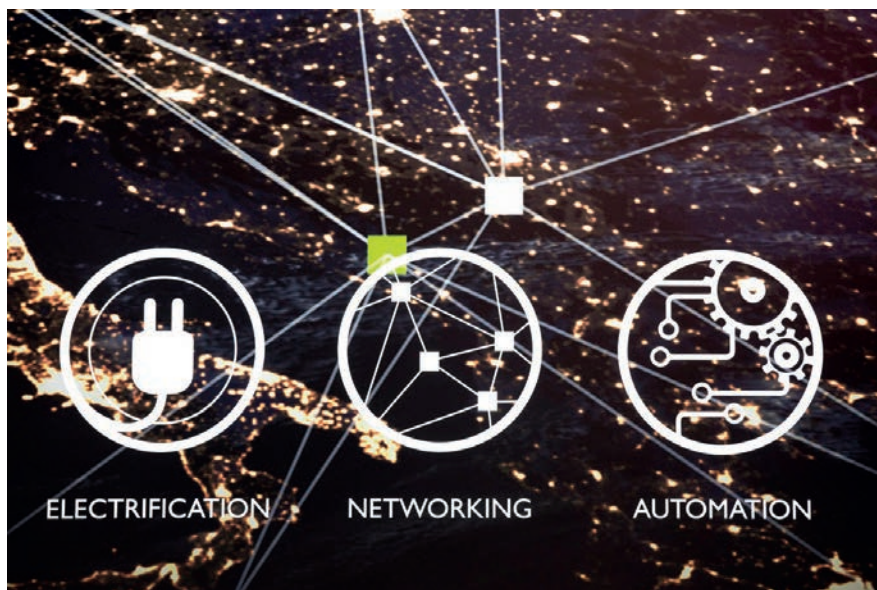
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HANNOVER MESSE 2023: Electro and Digital Technology, Plus IT, Pave Road to Energy Efficiency

Industry faces the challenge of reducing consumption to counter rising energy prices, reduce its carbon footprint and at the same time, be prepared for various taxonomies dictated by capital providers and/or governments.

Potential energy savings are spawned by the interaction of IT and OT (operational technology). Smart Energy Monitoring from Hannover Messe exhibitor Baumüller, for example, helps users determine and subsequently optimize their carbon footprint. But most industrial users are still barely aware of many concealed consumption cases. Unregulated motors in pumps, fans, compressors or machines are still part of everyday life in many factories. Without control technology and the interaction of OT and IT, energy efficiency improvements are



scarcely feasible. Direct current lines (DC), for example, are gaining in importance. The advantage of DC is that frequency converters will become smaller, and the factory will become a “prosumer” – i.e. both a consumer and a supplier of energy. In addition, machines will communicate with the energy supply, or companies will build smart grids within the company – for example, to use employees’ e-cars as intermediate storage units. At the same time, customers are demanding greater system efficiency. A logistics center doesn’t always have to run at 100 percent capacity when the machines know that a truck is stuck in a traffic jam. “To solve such tasks, you need domain knowledge. That’s what we have as automation companies, and that’s why many tech companies envy us,” explains Christian Wendler of the exhibiting company Lenze. He predicts a decade of automation.

The Energy 4.0 Conference Stages at Hannover Messe are dedicated to precisely these issues, providing an outstanding communication and competence platform for topics of an energy-intelligent, climate-friendly and sustainable future. Here, industry thought leaders, first-rate experts and practitioners will present the latest trends and answer industry’s questions. The many European automation companies are certainly also winners of the higher energy prices, because they have the technical answers for many applications – from storage solutions to speed control or DC networks. Energy conservation can only be achieved through the interaction of data, algorithms and physics. In addition, there is the factor of connectivity. Until now, energy data has been left out of the equation for many companies. But companies need to bring production and energy data together. Automation can help to conserve energy, water and CO₂. One example is the Schaltbau plant. Both highly automated and with a DC power supply, it is expected to reduce costs by up to 35 percent. According to research conducted by Dr. Mirjana Ristic of Bosch Rexroth within the framework of technology scouting surrounding DC technology and the results of the publicly funded DC-INDUSTRIE project, there is great potential for energy savings in this technology: “Industry consumes around 45 percent of the electricity in Germany, with drive systems accounting for around 70 percent of it. If we start there, we can achieve major efficiency gains,” she explains. Within the German Electro and Digital Industry Association (ZVEI), experts calculate an energy conservation potential of around ten percent, with an estimated cost effect of approximately 20 percent. This is mainly due to savings involving AC to DC converters on motors. Average plant availability can moreover be increased to around 98 percent, according to the experts.

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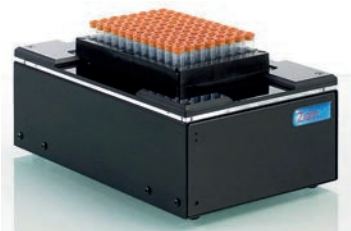
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Hannover Messe 2023: ELGi to Showcase Advanced Compressed Air Solutions

ELGi Compressors Europe will present its compressed air innovations through five products at Hannover Messe Compressed Air and Vacuum exhibition in Hannover, Germany, from the 17th to the 21st of April 2023, booth D31 in Hall 4. The ELGi AB Series portfolio of oil-free air compressors offers the highest level of air purity and significant gains in energy efficiency and sustainability, at a low total cost of ownership. The ELGi OF Series of air compressors comprise integrated Heat Recovery Systems for optimal energy reuse in the form of hot water. The ELGi EG Series of air compressors with 2-stage compression and new drive motors are aimed to improve efficiency. The ELGi LD Series, lubricated direct drive reciprocating air compressors, is an innovation in piston air compressor technology. Last, ELGi will showcase Data-driven, end-to-end compressed air system audit assessment and remote monitoring tools that enable operators to identify areas of air loss or inefficiencies, resulting in increased system performance, sustainability, reliability, and cost efficiency.



Ziath acquired by Azenta



Founded in 2005, the Ziath range of innovative 2D barcode readers are a key component of the laboratory automation workflow serving pharmaceutical, biotech and academic customers worldwide. CEO and co-founder of Ziath, Neil Benn will continue to lead the business as part of the Consumables and Instruments business within the Life Sciences Products segment. He commented “We are looking forward to integrating our great scanners with Azenta’s premium offering for sample management and handling in the life sciences segment”. Azenta, Inc. is a leading provider of life sciences solutions worldwide, enabling impactful breakthroughs and therapies to market faster. Azenta provides a full suite of reliable cold-chain sample management solutions and genomic services across areas such as drug development, clinical research and advanced cell therapies for the industry’s top pharmaceutical, biotech, academic and healthcare institutions globally.

Continental Strengthens Drive Belt Portfolio

Standard, Advanced, Supreme Performance: This is how the performance level of Continental’s drive belts is set up to be identified in its industrial segment in the future – uniformly, worldwide. With its new and globally aligned name and brand structure, the technology company aims to bundle its forces for a clear, comprehensive and efficient presence. “We are harmonizing our portfolio worldwide and improving transparency for our customers, who can now read the performance level and properties of a belt directly on the product,” says Rodrigo Maia, who heads up Continental’s industrial drive belt business. “With our unified approach, we will continue to strengthen the Continental brand and our belts will appear in the premium look that matches their product quality. This opens the door for further improvements and new products.”



5G Smartphone for Hazardous Areas

i.safe MOBILE, innovation and global market player for explosion-proof mobile devices and solutions announces the immediate availability of the world’s first 5G smartphone for ATEX and IECEx zone 1/21. The intrinsically safe mobile device, which was also developed for use in 5G campus networks, offers companies great flexibility potential thanks to its wide range of possible applications, especially in the automation sector. The extensive deployment scenarios range from predictive maintenance, AR applications, control and cooperation of production robots and production lines, management of Automated Guided Vehicles, remote monitoring and support to PTT video calls in the system area to prevent plant failures. The high-performance Qualcomm® QCM6490 chipset, a large 6-inch display, 48 MP main camera, and standards such as Wi-Fi 6, Bluetooth 5.2 and NFC complete the Android 12 smartphone’s extensive feature package.



Report on Sustainable Innovation at SCHURTER

The company is constantly developing their portfolio to meet the new requirements of climate change and technological progress.

The development of IoT allows manufacturers to make their products smart. The SCHURTER Smart Platform, which includes a cloud, user app and device firmware, provides the foundation for developing further products in adequation with the requirements of climate change.

Sustainability through digitalisation

Devices and products that are connected directly to the Internet are becoming more and more prevalent in our everyday lives. The development of IoT (the Internet of Things) allows manufacturers to make their products smart, i.e. enable their connection to the Internet and thereby open up additional functionalities. With the Smart Connector DS11, SCHURTER offer an integrable appliance inlet solution that can be connected to a cloud. This communication capability opens up possibilities for enhancing a simple inlet with additional features. One application is the analysis of measured energy data by artificial intelligence in order to generate usage patterns automatically. Based on this, the respective device is automatically shut down to prevent wasteful operation, such as unnecessary cooling cycles, without foregoing functionality.

Depending on the calculation assumptions, the Smart Connector consumes 0.5 to 0.8 watts of energy per hour – including data traffic thanks to the low data volume of 1 KB/min. This is just a fraction of the energy consumed by comparable devices in standby mode. In the case of a water dispenser, at least 20 per cent of the energy consumption can be saved by preventing unnecessary cooling. For 10 litres of cooled drinking water, this corresponds to around 50 to 60 watts per hour.

The SCHURTER Smart Platform, which includes a cloud, user app and device firmware, provides the foundation for developing further products. A standalone module (DT31) will be realised as a next step for retrofitting everyday devices to enable communication, thereby tapping into further energy saving potential.

New production technologies

For a number of years now, additive production technologies have been opening up interesting possibilities for saving materials in the production of plastic and metal parts. Components can be manufactured according to wishes with the desired technological characteristics and minimal material consumption in a matter of days. SCHURTER applies this additive production method in prototype construction and the production of small series with a batch size of fewer than 1,000 units in order to act quickly and precisely. Moreover, the company is increasingly using numerical calculation tools to counter increased material consumption in the development phase. This allows them to reduce costly and material-intensive testing procedures.



2023 Top Companies: Mosca Named Germany's Best Machine Manufacturer

Mosca has won the "Company of the Year 2023" award from Focus Money magazine, ranked highest in the machine manufacturing category

According to the results of a meta-analysis conducted by Focus Money magazine, Mosca is Germany's best machine manufacturer. This award recognises the companies that performed particularly well in the previous analyses: Price/Performance Winner 2022, Highest Trust 2022, Customer Favourites 2022 and Germany's Best – Sustainability 2022. Mosca ranked at the top of the machine manufacturing category with 100 points, setting the benchmark for companies across the industry.



Commissioned by Focus Money magazine and Deutschland Test,

the study to determine the Company of the Year 2023 was carried out by the IMWF Institute for Management and Economic Research. The meta-analysis summarises the results of four previous studies that surveyed more than 19,000 companies in the period from February to August 2022 using artificial intelligence and neural networks. Four factors – price/performance, customer confidence, service quality, sustainability – each accounted for 25% of the overall ranking. Mosca performed extremely well in all four categories and competed against all other companies in the study to receive top marks in the machine manufacturing segment.

Resource and energy efficient

Focus Money has already presented multiple awards to Mosca for its high level of sustainability. In 2021 and 2022, the company ranked at the top of the machine manufacturing segment for Germany's Best – Sustainability award. This assessment looks at environmental sustainability as well as economic and social sustainability. Mosca stood out in all areas for its high level of innovation and its initiative. While Mosca machines save energy and lower emissions thanks to SoniXs ultrasonic sealing technology, the company's strap materials are produced with green electricity and use a predefined proportion of recycled plastic. Mosca actively supports regional programmes, for example, with an annual project competition that targeted local environmental protection programmes in 2020 and 2022.

Innovative service concepts

Mosca is also steps ahead when it comes to service quality. The company's OneService concept, launched in 2018, guarantees standardised quality worldwide with swift support from Mosca experts. Two innovative new services are scheduled to launch in 2023. One is the Mosca TechCenter that will enable customers to test transport security systems in detail. The other is the new Mosca Spare Parts Kit that will ensure faster maintenance for wear parts. Customers can order a package of spare parts specifically tailored to their machine. This makes it possible to replace defective components on the spot and minimise machine downtime – even when supply chains are running at maximum capacity.

Long-lasting machines for every need

The Mosca approach to price/performance is based on ensuring the highest possible quality with the right machine for every requirement at the end of the packaging line. CEO Timo Mosca explains: "We place top priority on the quality and longevity of our solutions. Mosca machines continue to run reliably even after millions of strapping cycles. As a result, our customers reap the benefits throughout the entire service life of the machine." Mosca supplies a wide range of machines to meet every need and budget: from semi-automatic units for random manual applications to high-performance Industry 4.0 solutions for fully automated, digitalised production lines. The Mosca portfolio also offers a variety of strapping materials for different applications.



Siemens and EnergyHub Join Forces for Next Generation DER Management

EnergyHub is a leading provider of grid-edge flexibility with nearly 1 million DERs under management, while Siemens brings extensive power grid expertise, global footprint to partnership

Siemens has partnered with EnergyHub to expand its ecosystem of partners for its grid software business. EnergyHub provides a top-tier grid-edge management solution, which combines its DERMS platform with turnkey program management to enable utilities to scale grid-edge flexibility. EnergyHub controls all classes of DERs including thermostats, electric vehicles, energy storage, and solar inverters. The company works with over 60 North American utilities to manage more than 1.3 GW of flexible capacity. Siemens is a leading provider of grid planning, operations and maintenance software and brings extensive power systems and grid control domain expertise to the partnership.

Accelerated DER growth to challenge state-of-the-art grid management

The companies will interface their complementary solutions to empower utilities to move towards a holistic and scalable end-to-end next generation DER management solution. This means utilities will have better DER visibility, forecasting, and management, which will enable them to better plan, operate and maintain an increasingly DER-centric grid in the future by breaking down silos across utilities.

“Utilities have to re-think how to manage power grids because DERs will continue to grow significantly over the next decade. Knowing about DER contributions to our power grids is very important to shift loads to periods when there is less stress on the grid. Siemens and EnergyHub will be strategically cooperating on complementary portfolio elements for a next generation DER management by combining Siemens’ network expertise with EnergyHub’s proven grid-edge capabilities. This partnership will enable utilities to reach net-zero by leveraging DERs as a non-wire alternative solution such as investments in hardware. Ultimately, this will enable utilities to unlock unprecedented levels of DER flexibility and resilience of the power grid,” said Sabine Erlinghagen, CEO of Grid Software at Siemens.

“It is impossible to decarbonize electricity without grid-edge flexibility to complement the growing mix of renewable generation. Now that our grid-edge programs are gigawatt-scale resources, it is critical that they interconnect deeply with core utility operating systems. This partnership with Siemens—a global leader in electricity-industry software—will enable grid-edge resources to transform the utility enterprise in a way that is win-win for utilities and their customers,” said Seth Frader-Thompson, President of EnergyHub.

Open and modular approach will improve DER flexibility

Siemens is a leading company for software for power grids. About 70 percent of the world’s electricity consumption or 16,000 terawatt hours each year already flows through infrastructure simulated by Siemens’ grid software. Today, 1,300 control center systems – that operate and control grids – based on Siemens’ software are in operation worldwide, keeping the lights on for hundreds of millions of people.

The Siemens Grid Software Suite is part of Siemens Xcelerator, an open digital business platform designed to accelerate the digital transformation and value creation across industries, transportation, grids and buildings. An important aspect of this strategy is an ecosystem of partners with complementary portfolios.

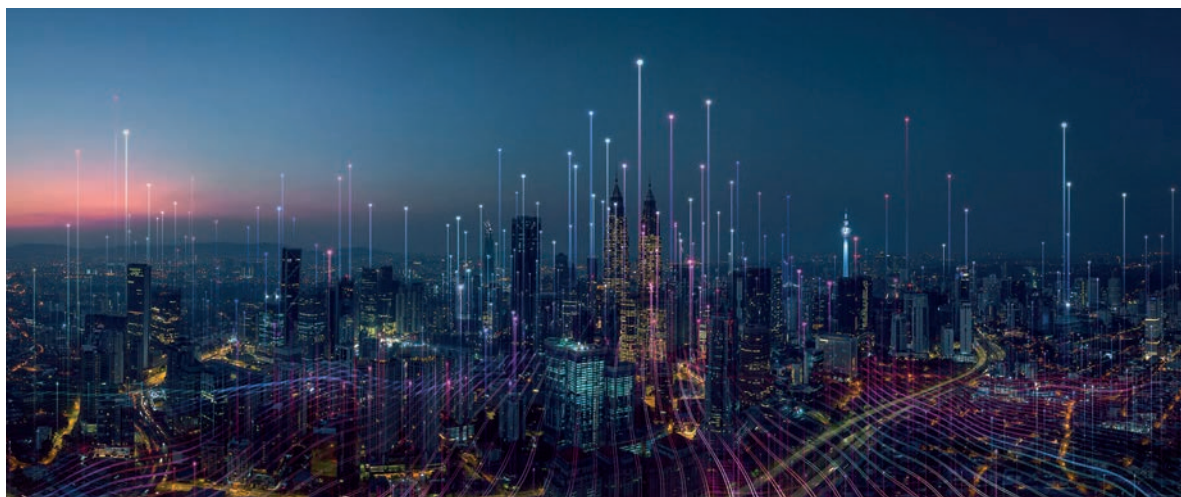


ABB Partners with Boliden in Drive Toward Circular Economy

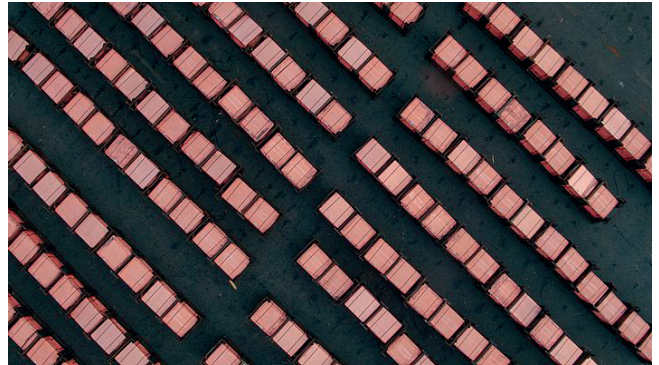
Daniel Eberli, Head of Product Management and Marketing IEC LV Motors Division, ABB explains how the company's high efficiency motors will feature recycled and low carbon copper from Boliden – a partnership that demonstrates the circular economy in action

To address climate change, the world must cut CO₂ emissions by 50 percent over the next seven years. No single solution will be enough to meet this ambitious target. Industrial energy efficiency, for example, has a critical role to play in reducing greenhouse gas (GHG) emissions. An even more holistic approach is circularity, which aims to minimise resources use and emissions across the entire product life cycle.

Technology and business models based on a circular economy – where businesses create supply chains that recover or recycle the resources used to create their products – can make a significant contribution.

This is because recycling eliminates emissions associated with retrieving raw materials through traditionally carbon-intensive industries like mining.

At ABB, we've set a target to take a circular approach to at least 80 percent of our products by 2030. An important example is our strategic partnership with Boliden, the Swedish mining and smelting company. This collaboration forms an integral part of ABB's strategic ambition to reduce the environmental impact of raw materials used in our products by replacing them with lower carbon alternatives.



Resource-Efficient Partnership

ABB uses a great deal of copper to manufacture its motors and other industrial electrical equipment. However, the production of this vital material is very energy intensive.

Boliden has addressed this challenge by developing low-carbon copper that it mines using fossil-free energy. It also produces copper using secondary raw material from recycled products. The carbon footprint of these "green" copper products is 65 percent lower than the industry average.

The first step in our partnership involves switching to low-carbon and recycled copper to cover the demand for our IE5 Ultra-Premium Efficiency SynRM and e-mobility motors in Europe. This will enable a significant reduction in the carbon impact of the raw materials used in these products. For example, a 75kW motor weighing 650kg might include 80kg copper. Using Boliden's copper, it is possible to save approximately 200kg of CO₂ emissions for each motor we manufacture – cancelling out emissions equivalent to burning 100kg of coal.

Upgrading to Energy-Efficient Motors

ABB also signed a memorandum of understanding with Boliden to support the mining and smelting company in identifying inefficient low-voltage motors across its operating units. These motors can then be replaced with high-efficiency motors within ABB's take-back upcycling framework, with the old motors recycled to provide raw material for Boliden's recycled copper. Motor efficiency has improved rapidly over the past decade due to investment in research and development by manufacturers. For example, today's IE4 motors deliver up to 40 percent lower energy losses than earlier IE2 models. If operators worldwide replaced their older motors with optimised, high-efficiency equipment, global electricity consumption would drop by up to 10 percent.

In addition to the environmental benefits, upgrading to more modern motors also makes good business sense. The reduction in energy bills often delivers payback in a matter of months with energy prices at their current high level.

Designing for Circularity

Apart from using recycled copper, ABB is committed to increasing the use of recycled electric steel (e-steel) and recycled aluminium. We have already designed our motors to be up to 98 percent recyclable, with the remaining two percent of materials available to be incinerated for heat recovery. Recycling copper, aluminium and steel offers significant energy savings compared to virgin production.

Ultimately, a widespread transition to more efficient technology can yield significant energy and emission reductions. However, this must be supported by collective, joined-up thinking to make circularity the norm rather than the exception.

Daniel Eberli, Head of Product Management and Marketing IEC LV Motors Division, ABB



3D-printing Material and Fastest High-precision Printer Create Human Body-like Micro-environment

Fast & reliable production of cell-culture device for IVF with new material and NanoOne-printer

A novel material for 2PP 3D-printing will contribute to a breaking innovation in the in vitro fertilization (IVF) market. UpFlow, a photopolymerizing material developed by UpNano GmbH (Austria), allows the fast and precise 3D-printing of micro-environments for a novel type of dynamic cell culture. Developed by IVF-specialist Fertilis Pty Ltd (Australia), this offers a better controlled and less variable environment for embryos before implantation and mimics the human body closer than other products currently on the market. Together with a NanoOne 2PP 3D-printer by UpNano, this allows for a 30 – 40% reduction of implantation cycles as commonly required to get pregnant, thus saving patients' emotional and financial pain.

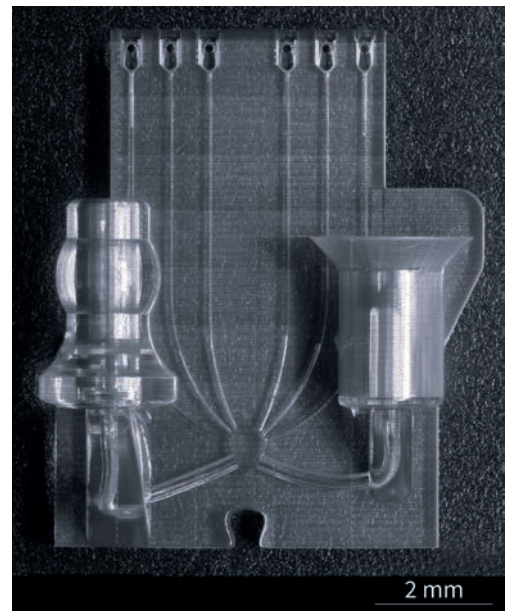
Keeping embryos safe and well in IVF requires exposure to repeatedly changing conditions during the pre-implantation phase. Not only does this cause significant stress, but it also increases the risk of failure, making repeated IVF cycles necessary. To reduce stress to the embryo and increase success rates of IVF, Fertilis developed and patented a unique environment for the critical life phase between fertilization and implantation of the embryo. This 3D-printed micro-device incorporates features 0.05mm in diameter and allows to precisely monitor and control the culturing process of the fertilized egg, eliminating the need for IVF-practitioners to move cells between petri-dishes.

And it is exactly those minuscule features – channels with a diameter smaller than a human hair – that proved challenging in the production – especially with material and printers from other manufacturers. UpNano achieved this by choosing specific base res-

ins for the UpFlow material that keep the viscosity of the material low until a final UV-exposure hardens the material and makes it ready to use. Other advantages of the material include a high optical transparency – making it ideally suited for microscopic inspections of the incubated embryos – and a very low autofluorescence.

Fertilis uses UpFlow with a NanoOne-printer recently delivered to the Australian National Fabrication Facility (ANFF) at the University of South Australia. This printer not only improves the quality of the 3D-printed micro-device for incubating embryos, but also the speed of production as Marty Guavin, CEO of Fertilis, explains: "Previously, the 3D-printing of our microfluidic devices took a full fortnight. Now 4h only. That is an exceptional acceleration of the production process. And, best of it all, using UpFlow results in a better-quality product than achieved before."

Using a NanoOne also allows to take full advantage of its adaptive resolution technology. This can modulate the focus width of the laser beam whilst printing. By this, larger and smaller features can be printed in one go, increasing production time and quality. Denise Hirner extends: "The microfluidic device of Fertilis have minute channels as well as larger structures to connect the device to tubes necessary for the incubation process. Being able to print across a range of scales – from nanometers to centimeters – the NanoOne can print this all in a single production cycle." This greatly enhances the tight fitting of the connectors to the tubes and



reduces the risk of any leakage.

Taken together, microfluidic devices manufactured using UpFlow on a NanoOne printer protect the embryo and enable automated changes of the nutrient medium that surrounds the embryo. This provides the most optimized growth environment ever developed for IVF. Marty Guavin adds: "Our device allows fertilization, embryo culture and embryo cryopreservation to occur in the one structure – no more moving embryos around by hand. This, in fact, increases the success rate significantly and reduces time, costs and stress for the parents." For UpNano, the development of UpFlow demonstrates once more the enormous potential of 2PP 3D-printing for cell and medical research.

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Bühler Shows Profitable Growth in 2022

With numerous opportunities in its markets and a high order backlog of over CHF 2.1 billion, the company's ambition is to continue its positive development in 2023.

In 2022, Bühler expanded its business and improved profitability in an uncertain and volatile business environment. The company was able to mitigate effects of the war in Ukraine, tense supply chains, and soaring energy and raw material prices, while further improving its financial position with a high equity ratio and repaying the first tranche of its bond. "The impressive dedication of our employees worldwide helped us to be agile, resilient, and creative, even in the face of increasing volatility and uncertainties," says Bühler CEO Stefan Scheiber.

At the Group level, order intake rose 8.7% to CHF 3.3 billion and order backlog was robust at CHF 2.1 billion. Turnover increased by 10.3% to CHF 3.0 billion. EBIT improved by 36.0% to CHF 199 million, reflecting an EBIT margin of 6.7% (prior year: 5.4%). Net profit went up 35.7% to CHF 154 million (prior year: CHF 113 million). With these results, Bühler has largely managed to reach pre-pandemic business levels.

Advanced Materials as growth driver

The growth in volume came mainly from the Advanced Materials business, where order intake soared by 40.6% to CHF 871 million, nearly doubling its volume within the last two years. Within Advanced Materials, the Die Casting business showed an outstanding performance, growing orders by 60.4%. Turnover in Advanced Materials increased by 31.8% to CHF 671 million. The Consumer Foods business continued its recovery with strong order intake growth of 21.6% to CHF 710 million, and turnover growth of 13.6% to CHF 578 million. The Grains & Food business, Bühler's largest business, showed solid performance despite being particularly impacted by disrupted supply chains and a slow feed market in China. The segment saw order



intake in 2022 of CHF 1,663 million, down 6.5%, while turnover grew by 2.6% to CHF 1,696 million, and with this managed to keep business very stable throughout the Covid-19 pandemic. All regions contributed to Bühler's turnover growth, with the Americas and Middle East Africa & India standing out. Regional growth rates and turnover shares were as follows: Asia 6% growth to 32% of the total share of turnover; Europe 3% growth to 30%; North America 17% growth to 17% and South America 26% growth to 5%; Middle East Africa & India 24% growth to 16%. With these successes in important markets, Bühler's global distribution of turnover is very robust and balanced.

Bühler's Customer Service business (including Single Machines) also grew by 3.4% and added substantially to the 2022 results with turnover amounting to CHF 955 million, representing a

32% share of Group turnover. Bühler offers a holistic service portfolio with seven modules from hardware, components, and spare parts to upgrading, maintenance, software and process optimizations for systems, with the objective of improving the performance of the existing customer asset base in terms of efficiency, safety, and sustainability. Sustainability gained importance in 2022, as services are the fastest lever to reduce energy, waste, and water in existing plants. "We judge the good business performance in 2022 as a confirmation of our strategy to be a provider of sustainable solutions and services, and to be a reliable and innovative partner in creating value for our customers," says CEO Stefan Scheiber.

Strong financial position

In 2022, Bühler's financial position improved





further, with the equity ratio increasing by 2.6pp to 49.8% (prior year: 47.2%). An important milestone was the repayment of the first tranche of the corporate bond of CHF 180 million in December. In 2017, Bühler raised capital on the financial markets for the first time in the form of a CHF 420 million dual tranche bond to invest in its growth and innovation capabilities. The second tranche of the bond of CHF 240 million is due in 2026. "Our ongoing solid financial position enables us to continue investing in new solutions and services and to remain fully independent in the long term," says CFO Mark Macus.

Innovation and collaboration through partnerships

In 2022, Bühler expanded its innovation and education ecosystem. The Networking Days event in June provided the opportunity to bring together 1,000 industry leaders who engaged with each other on how to improve energy and food security, reduce waste, cut water usage, lower CO₂e emissions, improve biodiversity, and rethink mobility. Bühler announced several joint ventures and partnerships that will facilitate the transition towards more efficient food and feed production and accelerate the shift towards sustainable mobility during this key event.

2022 also marked an important milestone for Bühler in terms of sustainability as it announced the next level of targets with more tangible goals and action plans. Bühler has developed a pathway to achieve a 60% reduction of greenhouse gas emissions in its operations by 2030 and has committed to having solutions ready to multiply by 2025 that reduce energy, waste, and water by 50% in the value chains of its customers.

To keep the pace of innovation high, expenses for research and development (R&D) remained stable at CHF 141 million representing 4.7% of Group turnover in line with the Bühler strategy to be the technology leader of the selected industry segments. Continuing its innovation promise to sustainably transform value chains, Bühler launched some 40 new products, including six new core products, in 2022.

Investing in people

It is thanks to the efforts and dedication of our employees that Bühler was able to achieve these good results despite the many challenges faced by the markets. A special mention should be made to Bühler China. Though they faced strict zero-Covid restrictions, regional lockdowns, and energy disruptions, they kept production facilities running.

Throughout 2022, Bühler has been building on and complementing the programs it has in place for the development and lifelong learning of its more than 12,700 employees globally. In 2022, Bühler onboarded 230 new apprentices across Europe, North America, South America, Africa, and Asia who are enrolled in three- and four-year courses covering nine different vocational fields. In total, Bühler employs 500 apprentices globally.

Creating one food segment and increased focus on services

To further increase the value offered to customers, Bühler will integrate its Consumer Foods segment into the Grains & Food segment and will strengthen its focus on its service offerings for the whole Group. Building one harmonized food and feed segment will allow for more direct interfaces to customers and increase the ef-

iciency of processes. It will be led by Johannes Wick, CEO of Grains & Food. Germar Wacker, who headed the Consumer Foods segment, will take up new opportunities outside of Bühler. He will support Johannes Wick in the transition and leave the company at the end of Q1 2023. "We thank Germar Wacker for his massive contribution in making the acquisition of the Haas Group a success and wish him all the best for his personal and professional future," says CEO Stefan Scheiber.

To accelerate the positive development of Bühler's service business, Samuel Schär, who held the positions of CEO Advanced Materials and Chief Services & Sales Officer, will fully focus on leading the global Services & Sales organization going forward. The Advanced Materials business will be led by Marcel Natterer, who successfully managed Bühler's Value Nutrition business area in the past 10 years. He has also been appointed Member of Bühler's Executive Board.

Outlook: continue positive development

While 2023 will likely continue to be challenging, Bühler is starting the year with a solid financial position and high carryover of orders. Thanks to developments in the markets Bühler serves, there are many opportunities for which the company can provide solutions that create impact and value for customers.

Despite all the uncertainties, Bühler's ambition is to continue its positive development. "Overall, we are convinced that Bühler is well prepared to take another positive step in developing the business successfully in 2023, even in a very dynamic market environment," says CEO Stefan Scheiber.

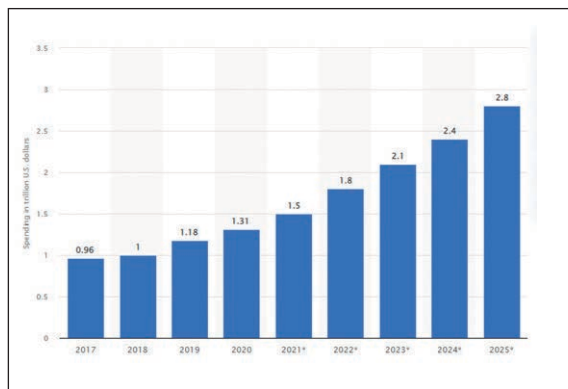
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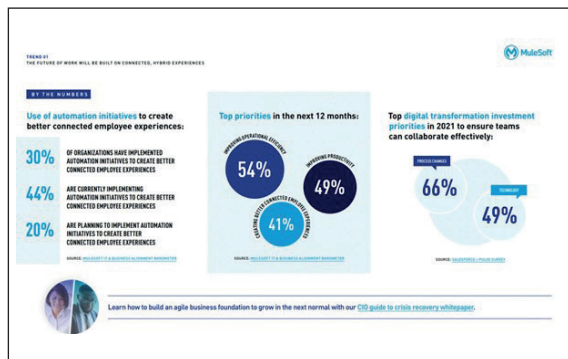
How Automation is Helping Businesses Unlock the True Value of Digital?

Automation is turning out to be a driving force in accelerating digital business transformation initiatives, transforming worker and customer experiences in today's highly connected world.

The global digital transformation market is poised to reach a staggering \$2.8 trillion by the end of 2025. Businesses across the globe are fast catching up with the digital bandwagon embracing coming-of-age technologies to accelerate their digital journey.



Automation can drive productivity, accelerate time-to-market and reimagine customer and employee experiences as we see them



Caption: Statistics on how automation is helping to create better and connected experiences

today in today's digital-first and hybrid work environment. According to Gartner, automation is a business-driven and disciplined approach that enterprises can leverage to rapidly identify and automate various mission-critical business processes utilizing

next-gen technologies and concepts like machine learning and artificial intelligence (AI).

How Automation Unlocks True Digital Value for Businesses?

According to a Salesforce report, more than 95% of IT managers and experts believe that process automation is the key to successful digital transformation. Without automation, businesses are on the verge of becoming obsolete and irrelevant

in today's digital-first era.

Automation is turning out to be a driving force for modern digital enterprises. It is helping to digitize routine processes, streamline operations/workflows, cut unplanned outages and costs, lessen MTTR and create a more productive workforce, ultimately contributing to the bottom line.

1. Improved Productivity and Efficiency

Intelligent process automation reduces errors and eradicates routine and manual tasks that are otherwise performed manually. Automation paves way for error-free operations. Workflow automation on the other hand en-

ables employees to focus more on challenging and creative tasks that require greater human touch and interference.

Further, integrating databases and systems reduces the time-consuming and daunting manual data entry work. According to McKinsey, organizations reported a 35% increase in efficiency after automating routine data entry operations.

2. Improved Customer Experience

Automation prevents customer inconvenience and frustration by ensuring that they access information quickly and easily. In fact, automation is the key to driving customer satisfaction levels for more than 60% of companies worldwide.

Enterprises have been using automation to analyze repetitive customer concerns/issues, such as answering frequently asked questions or taking orders via phone through automated bots or virtual assistants that are powered by AI and machine learning technologies. Automation helps to offer personalized customer experiences, boost customer satisfaction levels and reduce response delays.

3. Reduced Costs

Automating routine processes such as data entry, document management, approval workflows, and financial processes helps to save both money and time. Further, automation minimizes production and inventory output times. It reduces unplanned downtime, eliminates redundant costs, and curbs operational expenses.

Most importantly, automation helps to bring down business costs, since it lets you re-



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OPEN AUTOMATION NETWORKS

Delivering TSN's Benefits to Manufacturing

CC-Link IE TSN

How Time-Sensitive
Networking will help solve
industry's problems today
and tomorrow

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HMS Networks further boosts
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industry-wide TSN
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Delivering TSN's Benefits to Manufacturing

How Time-Sensitive Networking (TSN) will help solve industry's problems today and tomorrow

Executive summary

Following the CLPA supplement published last April, as a series of articles related to examples of TSN implementation from companies such as NXP Semiconductors, Intel, HMS, Renesas and Moxa, the CC-Link Partner Association (CLPA) has teamed up again with IEN Europe in this 8-page special feature to highlight the benefits TSN can deliver to manufacturing. This special feature provides an overview of the CLPA's latest white paper exploring this topic and we invite you to download the complete document to learn more.

When it comes to time-sensitive networking, exciting times are literally ahead of us. Connected Industries are necessary to support the aims of Industry 4.0. They rely on data and the insights that can be gained from it. In such facilities, it is fundamental to set up seamless interconnectivity from the smallest sensor on the factory floor up to enterprise-level systems and beyond. TSN, supported by gigabit bandwidth, delivers this by enabling convergence, the ability for multiple types of

network traffic to share a common network architecture and thus avoid the data 'silos' of the past.

Industry 4.0-oriented digital technologies have the potential to transform manufacturing, but they also generate a vast amount of data that can become overwhelming if not managed properly. To succeed with value-adding digital transformation strategies, a converged, high bandwidth network infrastructure is crucial. Convergence refers to the concept of allowing everything to share the same network architecture, avoiding the complexity and cost of multiple networks. The ideal system should enable high-speed, real-time deterministic communications between disparate devices and systems, allowing data to be shared across the entire enterprise, regardless of its source or destination. This will provide the process transparency required for fully optimized operations by allowing data to flow from its source to where it can be processed to obtain actionable insights and then fed back into the process.

Having real-time control and coordination of multiple different shop floor or operational technology (OT) systems is also critical.

The white paper explores Time Sensitive Networking (TSN) as a network technology that can address these challenges. TSN can deliver four specific benefits to a range of industries:

1. Simplifying network architectures and machine designs, reducing costs, shortening project timelines, and increasing uptime. By employing convergence, systems no longer need multiple network types to handle all process traffic.



Download the full white paper here

2. Delivering greater process transparency and optimized operations. As a consequence of converged network architectures, having data flow to where it is needed is simplified.
3. Greater productivity, as optimized processes will run in the most productive way.
4. Better integration of operational technology (OT) and information technology (IT) systems, as a converged stream of data can be shared from the factory floor to supervisory systems more easily, simplifying the process of getting the data to where it can be analyzed and contributing to process optimization.

In summary, Industry 4.0-oriented digital technologies generate a large amount of data that can become overwhelming if not managed properly. A converged, high bandwidth network infrastructure is crucial to managing this data and achieving fully optimized operations. Time Sensitive Networking (TSN) can provide the necessary network technology to simplify network architectures, increase process transparency, productivity, and better integrate OT and IT systems.

The challenge of Industry 4.0 and the promise of convergence

The industry 4.0 paradigm is transforming manufacturing by using data-driven, automated technologies that increase digitalisation and interconnectivity within companies and their supply chains on every single aspect including R&D. By using the Industrial Internet of Things (IIoT), these technologies increase the digitalisation and interconnectivity within companies as well as with their suppliers and customers in their broader value chains. In this way, it is possible to develop smart, connected industries that benefit from fully optimised processes. At the core of any digital journey is the ability of companies to navigate massive and ever increasing volumes of data to gain unique, actionable insights that support real-time decision making. However, a key challenge for manufacturers is implementing effective data gathering and integration solutions to support visibility, analytics, and optimisation. Additionally, traditional industrial Ethernet has limitations in supporting the higher levels of performance, connectivity, and cybersecurity required by Industry 4.0 applications.



Delivering convergence across the enterprise

Typically, companies have been relying on multiple networks in their operations. The shop floor, or OT level, features production lines or processes where multiple networks are employed. Along with these may be non-real-time traffic, such as video frames from inspection systems, barcodes, printed information, quality and maintenance data. These have often required separate networks, leading to complex architectures that could be costly and time consuming to install, operate and maintain. As a result, there is often a limited ability to provide the level of transparency required to control processes in an optimum way. When it comes to sharing this data with higher level IT systems to make it available across the enterprise, managing the multiple streams and combining them has also been difficult.

To address these challenges, companies can adopt a converged approach that allows all devices and systems to talk on the same network architecture, avoiding the complexity and cost of multiple networks. Convergence enables the application of IT intelligence to OT systems, creating an in-depth understanding of machines, processes, and plants to

optimise processes, drive up efficiencies, and maximise productivity. However, convergence presents challenges and concerns that need to be overcome, such as traffic conflicts, lack of bandwidth, and prioritisation.

Before companies can progress on their Industry 4.0 digitalisation journey to full process optimisation, they need a network infrastructure that addresses the following challenges: convergence of multiple types of real-time process-related traffic, convergence of real-time process traffic with non-real-time traffic, convergence of different non-interoperable industrial Ethernet protocols, convergence of OT and IT systems, and ensuring all traffic is secure and protected from unauthorised access.

Time Sensitive Networking (TSN) can provide the right solution as it is an innovative, complementary technology that addresses the limitations of conventional industrial Ethernet. TSN enables convergence of multiple types of traffic while ensuring determinism, low latency, and real-time delivery. Additionally, TSN provides end-to-end security and protection from unauthorised access, making it a suitable technology for the Industry 4.0 era.

In its Chapter 3, the whitepaper discusses the automotive industry's challenges in implementing innovative manufacturing systems to address the increased demand for vehicles with more features and options while increasing operational sustainability. This industry is under more and more pressure to implement innovative manufacturing systems that can address all these needs while increasing operational sustainability overall. Two main challenges stand out. The first is handling the vast amount of data and processes in an assembly plant. The second is communicating with a large and complex supply chain. Time-Sensitive Networking (TSN) can help address these challenges by supporting gigabit bandwidth and the ability to converge multiple networks into a single architecture. This convergence can help to simplify complex systems found in plants, reduce system costs, expedite production schedules, and improve line efficiency. Convergence also offers a way to address the "islands" of automation in plants due to evolving installations, providing greater visibility and improved operation of processes. Keep-

ing systems secure against unauthorized access is also a key concern, and TSN provides a simplified foundation for monitoring network traffic to prevent harm. TSN is already being implemented in various automotive applications worldwide. This is further evidence that its benefits have been understood by the industry and that these are now being exploited in a variety of systems and processes at different end users.

The food and beverage industry and its needs are also reviewed in Chapter 4. This includes ensuring optimum process conditions to obtain delicious foods and beverages, filling, packing, inspection, casing, and traceability of the finished product. This sector requires high production speed and volume to be profitable. Smart manufacturing and data are becoming key topics to help meet production goals, and having visibility of how close processes are to maximum efficiency is necessary to run processes at the highest productivity. Raw material costs are one of the main determinants of profitability, and process optimization can deliver significant

benefits. TSN can address these challenges by providing a converged, gigabit communications architecture that can offer the potential for a high degree of process transparency, despite the use of many different systems across a plant. TSN also offers the opportunity for all systems to share information, ultimately providing the ability to see the big picture necessary to run a plant or line at maximum efficiency. Possible data islands caused by dissimilar systems can also be addressed by combining the traffic from different equipment onto the same network. Keeping the manufacturing process free of unauthorized interference is a key concern, and TSN provides a way to safeguard consumers and protect company reputations by making it simpler to monitor process data when converged onto a single architecture. Hence unauthorized actions can be detected more quickly and processes safeguarded in real-time. End users in the food and beverage sectors are already enjoying the benefits that TSN provides to their operations as they seek to address these challenges in the most effective, innovative ways.



In Chapter 5, the white paper reviews how the lithium battery industry is expanding rapidly, driven by the demand for electric vehicles. TSN technology can help the industry address the challenges of maintaining high-quality manufacturing processes while increasing production capacity. TSN provides a converged network architecture with gigabit bandwidth, allowing high-performance motion traffic to share the same network as other types of machine control, safety, and vision systems. This reduces machine complexity and costs while increasing transparency and optimizing cell quality. This also leads to machines that can be deployed faster and can be maintained more easily, leading to higher productivity. Having the process traffic share a common network also allows it to be shared with supervisory systems more easily. This opens the door for increased process transparency and further development of machine learning facilities that can optimise the quality of the cells, increasing yields and avoiding the high costs of scrap product. TSN has already been implemented in cell manufacturing applications where these benefits are being actively exploited.



Chapter 6 takes a look at the process industry, which includes chemical plants, oil and gas, and other sectors and requires a distributed control system that monitors and manages processes spread over a large plant area. TSN's ability to use a unified gigabit network architecture can help optimize these systems, reducing engineering efforts and system complexity, and avoiding the need for separate networks for different protocols. Moreover, it can remove barriers to the necessary and seamless integration

of all relevant plant systems (automation, instrumentation, networked IO, electrical distribution switchgear, safety instrumented systems, IIoT devices, edge gateways, etc.) for better plant operational and business performance. This can lower operational expenses, improve plant operations and product quality, and ultimately benefit customers and end-users throughout the value chain.

Finally, Chapter 7 covers the water industry. Water treatment is a critical activity that requires uninterrupted operation, low costs, and adherence to regulatory guidelines. The

water industry is now turning to digitalisation in order to assure its future success and initiatives like "Water 4.0" are examples of this. Processes such as chemical dosing need to be further optimised. Vast supply networks benefit from intelligent data acquisition which in turn raises the issue of handling the huge amounts of data they generate. Cybersecurity is a key topic. TSN's deterministic, converged networks with gigabit bandwidth can help ensure water treatment processes are optimized in real-time, making corrective action quicker, increasing energy efficiency, and contributing to the security of supply. Integrating preventative maintenance systems can help prevent possible loss of supply and environmental non-compliance. TSN also offers communication upgrade possibilities for older infrastructure, which can help bring them in line with future initiatives.

Overall, TSN technology can help these industries improve their performance and optimize their processes while reducing costs, increasing transparency, and benefiting customers and end-users throughout the value chain.

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Industry leader HMS Networks further boosts CC-Link IE TSN development ecosystem

Anybus® CompactCom 40 CC-Link IE TSN adds to the range of development options for device vendors developing CC-Link IE TSN products

The CC-Link Partner Association's (CLPA) partner, HMS Networks, announced the release of a new embedded development option for designers of industrial automation devices compatible with CC-Link IE TSN. HMS Networks' Anybus CompactCom 40 CC-Link IE TSN embedded communication interface provides a gigabit Ethernet connection and TSN functionality in one package. With CompactCom 40 CC-Link IE TSN, device manufacturers and machine builders get a fast track to connecting their products to CC-Link IE TSN networks for future-proof applications.

Benefits of TSN

CC-Link IE TSN is the first open industrial network protocol to combine gigabit Ethernet bandwidth with TSN functionality, delivering the advances of network convergence. Using the new Anybus device, product developers now have increased options when it comes to designing products that can take advantage of these benefits. The device can easily be designed into new products, or provide a convenient upgrade path for companies already using Anybus interfaces.

Working with CLPA to ensure fast, reliable communication

The CLPA supported HMS Networks in the development of Anybus CompactCom 40 CC-Link IE TSN, which is a fully compatible TSN product supporting certification class B. The award-winning Anybus NP40 industrial network processor is at the core of the CompactCom, ensuring high performance by transferring up to 1420 bytes of process data in each direction and guaranteeing synchronization accuracy of 1 μ s or less.

Available in two formats

As with all Anybus CompactCom 40 products, the CC-Link IE TSN interface is available in different formats, enabling customers to choose the form factor that suits their needs.

- **Module** – An all-in-one solution that enables the fastest time to market. It includes hardware, firmware, as well as connectors, and is available with or without housing.
- **Brick** – Hardware and firmware packaged in a very compact brick form factor. This is the best choice for applications with limited space, and if a specific connector or protection class is required.

Quick installation

To ensure a smooth installation, Anybus provides expertise and documentation such as example driver code and a generic configuration file (CSP+). The installation process is even more straightforward if customers have previously integrated another CompactCom product into their device or machine, as they can reuse their existing in-design work.

A strong partnership

"We have been working closely with the CLPA and are extremely happy to help expand the comprehensive CLPA development ecosystem with Anybus," said Samuel Alexandersson, Business Line Director, Anybus Embedded, at HMS Networks. "It shows our commitment to TSN and allows companies to start working with the exciting CC-Link IE TSN technology without having to develop a solution themselves."

John Browett, General Manager at CLPA Europe, comments: "We are delighted that HMS Networks is continuing to support our open network technologies and equipped its latest Anybus CompactCom 40 with CC-Link IE TSN connectivity. This is a state-of-the-art device that offers further possibilities for companies developing industrial automation products compatible with CC-Link IE TSN. It demonstrates further acceptance of our open network technology as an enabler for building products to leverage the benefits of converged network connectivity. In turn, this will address the challenges of Industry 4.0 applications. In turn, this will support machine builders and end users in the creation of future-oriented, smart solutions to drive productivity, efficiency and ultimately competitiveness."



CLPA - a partner in advancing industry-wide TSN conformance

The CC-Link Partner Association has announced that it is actively engaged with the Avnu Alliance, ODVA, OPC Foundation and PROFIBUS & PROFINET International (PI) as part of the TSN Industrial Automation Conformance Collaboration (TIACC).

The organisations will work together to develop a unified conformance test plan for automation devices that leverage Time-Sensitive Networking (TSN), driving standardisation, interoperability and interconnectivity.

Bringing together key global industrial network and communications specialists, the TIACC is an industry-wide initiative aimed at developing a solution for TSN conformance. The CLPA, collectively with all other leading organisations, will develop and agree a single common conformance test plan to certify TSN-compatible products, in line with the IEC/IEEE 60802 TSN profile for Industrial Automation.

The resulting methodology and practices will be released for use to the entire industrial automation ecosystem. By doing so, the TIACC partners

will promote the alignment of TSN-compatible solutions from different vendors, which is essential for the development of converged industrial automation networks.

The CLPA's commitment to TIACC is in line with the organisation's overarching strategy to drive the easy integration and openness of networks and devices from multiple vendors. In effect, the CLPA has a history of successful collaborations with other TIACC members, such as OPCF and PI, delivering interoperability and companion specifications aimed at maximising transparency between the different protocols available.

To further support interoperability, the CLPA also continuously invests in its standardised, global network of conformance testing facilities. These are engaged in the evaluation of devices that

use CC-Link IE TSN, the first open industrial gigabit Ethernet with TSN functions. Using this real-world experience, and as part of TIACC, the association can contribute to the creation of robust practices to ensure TSN conformance.

John Browett, General Manager at CLPA Europe, comments: "The creation of the Connected Industries of the future requires different systems and devices to communicate in order to deliver the necessary process transparency required. The belief in this principle is deeply rooted in the CLPA's ethos and at the core of why the organisation was founded. This is why we are delighted to be part of the TIACC and look forward to supporting the creation of a unified, common test plan for TSN-compatible products. By doing so, we can help further boost the adoption of future-proof technologies for smart manufacturing."



ONE

CC-LINK IE TSN: ONE NETWORK. ONE SOLUTION.

Combine Time-Sensitive Networking with gigabit bandwidth to create open, converged industrial Ethernet architectures that deliver significant business benefits, including:

- **Simpler network architectures/machine designs**
- **Greater process transparency and better management**
- **Better integration of OT and IT systems**

CC-Link IE TSN is ready to deliver these productivity benefits now to support your drive to Industry 4.0.

Learn how by scanning the code, visiting eu.cc-link.org or contacting us at partners@eu.cc-link.org



OPEN AUTOMATION NETWORKS

CC-Link IE TSN



motely manage disparate systems from a centralized hub saving you money and resources.

4. Improved Cybersecurity

Automating security operations and processes helps to protect hybrid as well as multi-cloud investments by deploying a new set of governance, controls, configurations, and automation across data and users spread across diverse workloads and environments. Security automation brings in improved visibility and context thus, helping IT and security admins to streamline compliances, as they can monitor usage patterns and identify threats/vulnerabilities quickly (real-time).

Examples of Successful Digital Transformation powered by Automation

1. Porsche puts Customer Experience (CX) at the heart of everything they do with automation

Porsche positions its customers first. The automobile leader invested in cutting-edge AI

and automation technologies to understand their customers and their needs. They have adopted a digital approach wherein they collect and process customer information into a powerful AI-powered CRM system and document every single customer interaction spanning multiple touch points. Now, this data helps in real-time segmentation as well as in predictive intelligence. Result – they contact only those customers that are actually interested to purchase a Porsche leading to a massive boost in sales conversion.

2. UPS saves huge with Automation

The international shipping and supply chain management giant used automation to deploy real-time package tracking and accelerate its delivery process. The company built a fleet management tool powered by machine learning algorithms. Result - reduced fuel cost and carbon footprint and increased driver productivity. The company now saves up to \$300M-400M yearly.

Takeaway

In today's digital-first era, automation is at the heart of digital transformation. Thus, aligning automation with your digital transformation goals can help your enterprise gain that competitive edge and scale up efficiently. We provide digital automation solutions that are tied directly to your business outputs. Moreover, our iterative project approach for a 'self-funding' digital transformation journey paves way for improved ROI and operational efficiency. Run automation solutions and tools on a few projects and processes before moving on to an enterprise-wide approach.

Futurism offers a full spectrum of Digital Transformation (DX) and Business Intelligence Solutions helping businesses leverage new-age technologies like Robotic Process Automation (RPA), Artificial Intelligence (AI), Machine Learning (ML), 5G, IoT, Data Science/Big Data, Cybersecurity, Blockchain, Mobility, Product Engineering, Cloud, and more.

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N° 3 - MARCH 2023

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What is Digital Twin Technology and Why is it Important for Manufacturers? Virtual Twin Experience

Whilst uptake in smaller manufacturing firms has been slower, automotive and industrial sectors are slowly starting to see the value that digital twin technology can bring, no matter the size of the business.

Digital Twin technology has quickly become a staple with many of the largest manufacturers in the automotive and industrial engineering sector around the world thanks to its ability to provide huge amounts of value in saving time and optimizing plant effectiveness.

What is Digital Twin & Virtual Twin technology?

Digital twin technology allows manufacturers to gain a digital representation of a real-world system – the digital twin mirrors the software or model to gain data and insight that can update

Digital twin is actually an executable model of a physical system. The physical system can be a factory or a plant or a mine or resource any of them. Which brings in learning and experiences from the physical part, so that you can continuously update your distribution model. The next step up from digital twin is virtual twins, which provide a far more dynamic look factory systems. Virtual twins provide businesses with the ability to visualize models and simulate sophisticated experiences—whereas digital twin solutions are static. Virtual twin essentially shows manufacturers exactly what can be executed and implemented in the real world, it's primary focus is to give actionable solutions to improve efficiencies.

In fact, Virtual Twin technology helps us visualize a model not only of the product, but manufacturing and operations as well. When thinking about the capabilities of digital twins, they operate in a closed loop of “ability to ability”, but virtual twin goes beyond that. It provides the opportunity where you



can control the real world with the virtual world with this closed loop ability and we can bring innovation to expand on that. Virtual Twin solutions can be beneficial for almost any manufacturing organization, both small and large. It also empowers workforce of the future, and considering current conditions, it's like bringing in new resiliency while people are working in the new or next normal due to this pandemic.

Which Industries Can Benefit from Digital & Virtual Twin?

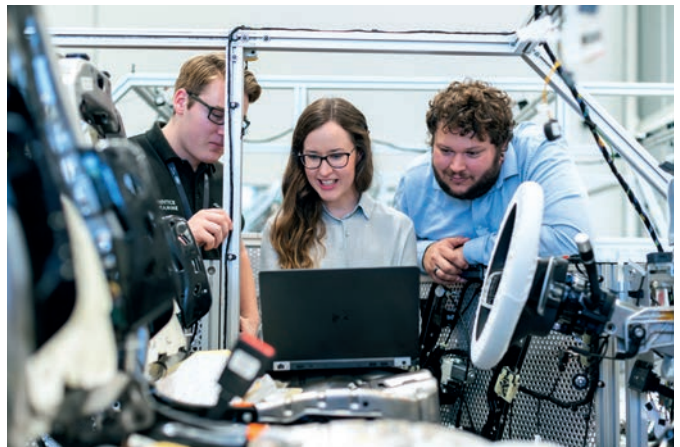
Digital twins initially found their way into a select few industries where businesses could easily see value and return on investment. The automotive & industrial equipment sectors were the two main areas that invested in digital twin technology initially, along with

oil and gas shortly after. These industries had a clear need for the insights provided by digital twins to streamline processes and provide extra efficiency.

In more recent times, manufacturing and life sciences are beginning to really catch up on the benefits that are brought about by digital twins as they're really relying on the twins ability to provide sophisticated models that can be acted upon. In manufacturing and the operations industries, the overall goal for most businesses is to achieve greater profitability in a safe and sustainable way.

The length and breadth of industries that can adopt this type of technology stretches far and wide, and the same can be said about virtual twin technology, as this is essentially a step further than the insights offer by digital twins.





Why Are Digital/Virtual Twins So Important for Manufacturers?

There are many benefits to having digital or virtual twins integrated into your workflow as a manufacturing business, though the most pertinent are normally time, cost and resource savings, increased levels of safety for all employees.

In recent years, there's been an increased focus on sustainable manufacturing and a 'circular economy', with real emphasis being placed on improving the overall productivity and safety of processes. Alongside this, there's been a real shift in manufacturing bosses looking for more control over production, whilst also minimizing costs. All of this

is covered by digital/virtual twins, as they give manufacturers access to important information about cutting costs whilst maintaining, and improving, workflows.

Whilst manufacturing and operations industries are becoming ever more complex due to the digitalization and innovation within each sector, so it's important that things are made as simple as possible. Operation lead times can begin to become longer and longer if inefficiencies in the new workflow aren't ironed out, and that's where digital and virtual twin technology comes in to play. Having the insight and agility to make changes in manufacturing is exceptionally important, especially with the supply chain issues that

are currently facing the vast majority of manufacturers around the world.

To really emphasize the effectiveness of virtual twin technology in particular, in one case study, DELMIA saw plant effectiveness increase by 250% after the installation of a virtual twin. The twin provided an in-depth analysis of inefficiencies and provided the manufacturer with simulation models that would help to combat those inefficiencies. Alongside this, employee safety and fulfillment rose by 5% in time savings.

In a separate case study, DELMIA saw another company increase on time deliveries by 50% thanks to better planning techniques and technologies. There was also a 50% reduction in lead times, which enabled the company to maintain high levels of orders, whilst shipping a higher percentage out on time to consumers. This is obviously exceptionally important when you consider how consumers are changing their behavior when it comes to reduced lead and delivery times.

In summary, digital and virtual twins are quickly becoming the staple within many industries thanks to the number of benefits they bring to each company. Manufacturing and logistics in particular can benefit from the technologies, thanks to vastly reduced lead times and help when it comes to planning efficiently.



Prashanth Mysore, Strategic Business Development and Industry Marketing Director at DELMIA, part of the Dassault Systèmes Group

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HANNOVER MESSE 2023: A Comprehensive Overview of all Industry Trends

IEN Europe interviewed Hubertus von Monschaw, Global Director for HANNOVER MESSE, Deutsche Messe AG, on the outcomes of the previous fair that followed the pandemic break, as well as some insights on this year's partner country: Indonesia.

HANNOVER MESSE came back last year as a live event after a two-year pandemic break. What lessons did you learn from this come back and did it meet your expectations?

After such a long break with many restrictions on group gatherings and travel, it will take a long time for a large international trade fair like HANNOVER MESSE to return to pre-corona levels. Nevertheless, we are on the right track: at HANNOVER MESSE 2023, we expect around 4,000 exhibiting companies from all over the world. The pandemic and the war in Ukraine have completely changed global economic and political environments. Industry therefore faces many new challenges today, with energy shortages, supply chain disruptions, a shortage of skilled workers, and climate change at the top of the list. One key to solving these problems lies in the consistent use of technology; another is proper economic policy. HANNOVER MESSE 2023 focuses on both: Technologies for a networked and climate-neutral industry as well as discourse between industry, politics, science, and society.

How do you evaluate the pertinence and efficiency of the digitalization of the products showcased as well as the use of your networking tool? Is it a strategy to be reconducted during the further events to come?

We staged a 100% digital HANNOVER MESSE in 2021 because a face-to-face event was not possible. We use the experience we gained to provide digital elements that complement the face-to-face trade fair. In 2023, for example, we offer live streaming from almost every stage at HANNOVER MESSE. In addition, visitors can take part virtually in the various guided tours and network virtually with exhibitors and other visitors. Networking tools are now standard at our trade fairs.

Can you tell us more about HM 2023 lead theme Industrial Transformation – Making the Difference, and the industry trends to be discussed?

HANNOVER MESSE is the only event in the world where leading companies from the mechanical and electrical engineering sectors join those from the IT, software and energy branches to collectively present solutions for a climate-neutral industry.

From digitalizing and automating complex production processes to



Hubertus von Monschaw, Global Director for HANNOVER MESSE, Deutsche Messe AG

tapping hydrogen to operate entire production plants to using software to record and reduce carbon footprints, HANNOVER MESSE delivers a complete picture of the technological possibilities for the industry of today and tomorrow. HANNOVER MESSE showcases innovative solutions to many current challenges while spotlighting global megatrends.

For example, artificial intelligence (AI) plays an increasingly important role in industry. In addition to optimizing processes, the manufacturing industry increasingly relies on AI in simulation and product development. So-called generative AI will also find its way





into industry. Systems such as ChatGPT or DALL-E can already provide support with text, programming and design. It is conceivable that AI will design machines in the future. On the subject of AI, HANNOVER MESSE offers a comprehensive range of visitor tours, forums and presentations of AI tools and use cases from exhibitors.

In the times of energy shortages, climate change and supply chain challenges, companies are eager to find solutions through technology. Can you tell us more about what is to come in regard with the solutions to be presented to answer these challenges?

Unregulated motors in pumps, fans, compressors and machines are still part of everyday life in many factories. Without intelligent control technology and the interaction of electrical engineering and IT, improvements in energy efficiency are almost impossible. In Hannover, providers of energy management solutions show smart energy monitoring systems that determine and optimize energy consumption at machine level and thus reduce the CO2 emissions. HANNOVER MESSE focuses on green hydrogen, too, because industry wants to free itself from its dependence on fossil energy. Germany's Ministry for Economic Affairs and Climate Protection describes hydrogen as a key energy source that is essential for the long-term success of the energy transition and for climate protection. But there are challenges, because producing green hydrogen is complex and expensive. In Hannover, more than 500 companies present hydrogen solutions for industry and experts explain and discuss issues such as availability, transportation and large-scale storage. For this reason, HANNOVER MESSE is the world's biggest and most important hydrogen platform. However, these are only two examples. HANNOVER MESSE provides a comprehensive overview of all industry trends from technological, economic and sociological points of view.

This year's partner country is Indonesia. What are they bringing to the event and how will they be represented?

Indonesia, which recorded economic growth of more than five percent in 2022, has reaped significant benefits from high commodity



prices. By 2030, Indonesia aims to be one of the world's ten largest economies. The Indonesia Pavilion is located in Hall 2 at HANNOVER MESSE. The Indonesia-German Business Summit takes place on 17 April. In addition, Indonesia stages a program of conferences, seminars and matchmaking events.

"Making Indonesia 4.0" is the country's motto for HM 2023. Do you expect many exhibitors from this economically dynamic part of the world? What technologies do you expect them to bring?

Indonesia wants to attract more labor-intensive manufacturing. Because of this, it will present itself at HANNOVER MESSE as a modern production location. Liberalized investment and labor laws have opened numerous sectors of the economy to foreign investors. In addition, new tax incentives direct funds into export production. Under the motto "Making Indonesia 4.0", more than 150 companies from Indonesia will participate in HANNOVER MESSE. In addition to "Making Indonesia 4.0", areas of emphasis include foreign investment and industrial parks, sustainability and energy transition, start-ups and innovation, and human capital.

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Optimizing the Application of Adhesives Thanks to Cobotics

Meler, HMI-MBS and Universal Robots pool their know-how to offer an adhesive application workshop with the help of a collaborative robot, on January 19 at Meler's Orleans facility.

The application of adhesives for every industry represents only a single stage of the production process in many sectors, as a part of the whole. This is why Meler France team, in collaboration with HMI-MBS and Universal Robots, organized a workshop on its premises to show how cobotics could optimized adhesive application at the end of the line.

Stabilisation of pallets with adhesive...and a cobot

The day's programme included a presentation by the organising companies and a live demonstration in which the attendees, with technical profiles from the aeronautics or automotive industries, were able to see the advantages that a collaborative robot can bring to any adhesive application. Sylvain Pitard, Sales Director of Meler's French subsidiary, and Julien Plaut, HMI-MBS sales technician, explained two real use cases of adhesive application in palletizing processes, see Figure 1 and Figure 2 (for web-mag readers click on the title to see pictures or at this link).

Production and environmental advantages

The logistics sector has been quick to implement the combination of both technologies: co-



Automatic application of adhesive on the moving box. / 2. Loading of the box and stacking on the pallet with a COBOT. / 3. Formation of a compact batch ready for transport.

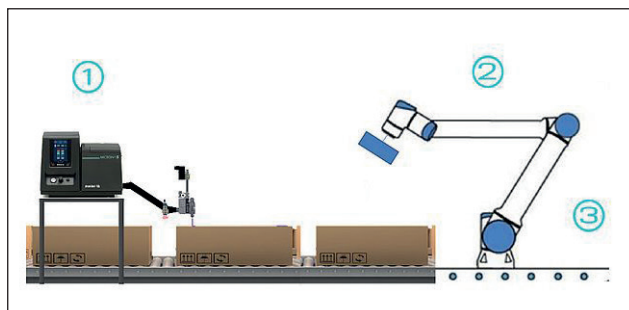
botics and adhesive application because of the production benefits they bring to the profitability of the end-of-line. Occupational risks related to loading and transporting goods are reduced (Figure 3 - 1) and operators can focus on higher value-added tasks.

However, the interest in introducing these technologies is not just about cost efficiency and safety. By introducing the application of adhe-

sives, the goal is also to eliminate the use of single-use packaging materials (Figure 3 - 2) and achieve excellent results in the unification of goods. This ecological aspect helps continue to driving companies to change their end-of-line installations.

In addition, the Q&A session allowed attendees to benefit from personalized advice in regards with the implementation of new projects. Sylvain Pitard, Sales Director of Focke Meler France, acknowledges his satisfaction as host: "It is exciting to resume the networking activities that are so typical of a sector like ours, where we always work as a team. It is this type of exchange that makes our commercial activity more valuable and we are also proud to have organized it in our Orléans facilities, which were inaugurated in the middle of the pandemic".

Loading of the goods with a COBOT. / 2. Automatic application of the adhesive on the box hold by COBOT. / 3. Moving and positioning of the goods at another point of the working line.



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A Next-Generation 5G Massive MIMO Radio Unit Platform Showcased at Mobile World Congress 2023

The collaboration between Analog Devices and Marvell Technology combines industry-leading digital beamforming and transceiver silicon to propel advanced massive MIMO into mainstream

Analog Devices, Inc. and Marvell Technology, Inc. announced their next-generation 5G massive MIMO (mMIMO) reference design platform with support for Open RAN. The combination of ADI's latest RadioVerse® Transceiver SoC and the Marvell® OCTEON® 10 Fusion 5G baseband processor – the industry's first 5 nm digital beamforming solution for 5G, improves the time-to-market for advanced mMIMO radio units and O-RAN support with up to 40% lower energy consumption, smaller size, and lower weight. The OCTEON 10 Fusion baseband processor also provides flexible L1 implementation, with hardware and software reuse across the RU (Radio Unit) and DU (Distributed Unit) to facilitate evolving L1 splits among operators worldwide over the coming years, while the RadioVerse SoC provides extensive digital RF front end capabilities including field proven DPD.

"As mMIMO radio functionality grows in complexity, more specialized silicon approaches are required," said Alex Jinsung Choi, Chairman of the O-RAN ALLIANCE. "Reference designs like the one created by ADI and Marvell help catalyze the O-RAN market for 5G mMIMO radio units by enabling advanced configurations that meet network operators' high expectations for power efficiency and performance."

Together, the RadioVerse Transceiver SoC and the OCTEON 10 Fusion processor support the entire signal chain with unmatched RU system efficiency. The ADRV9040 RadioVerse Transceiver SoC includes substantial digital capabilities including linearization algorithms for boosting power amplifier efficiency and performance, as well as digital channel filters which reduce interface rates. The OCTEON

10 Fusion 5G baseband processor has specialized accelerators optimized for efficiently processing complex beamforming algorithms, along with dedicated processors for the low PHY baseband which can be configured for the various O-RAN split 7.2x configurations.

"Infrastructure vendors face many challenges when developing O-RAN mMIMO radio units, including access to optimized semiconductors," said Joe Barry, Vice President of Marketing, Systems & Technology in the Communication and Cloud Business Unit at ADI. "The performance and efficiency of this platform makes industry-leading technology available to both established and emerging vendors."

"Marvell is pleased to collaborate with ADI in taking mMIMO radios to the next level," said Will Chu, Senior Vice President, Processors Business Group at Marvell. "The combination of Marvell's OCTEON 10 Fusion 5G baseband processor and ADI's leading RF transceiver technology provides OEMs a 5G Open Radio



Unit reference design that scales the capabilities and performance of next-generation mMIMO beamforming at the lowest possible power."

The reference design, which is expandable to support a 64T64R configuration, supports 32 transmit and receive antennas (32T32R) with 400 MHz of operational bandwidth and 300 MHz of instantaneous bandwidth. The OCTEON 10 Fusion 5G baseband processor and RadioVerse SoC leverage hardware accelerators as well as the industry-leading RF and digital baseband process nodes shipping commercially—16 nm and 5 nm respectively—delivering up to 40% reduction in energy consumption per bit as compared over the previous generation. The platform enables Network Energy Savings (NES) modes, which deliver additional power savings.

The platform was on display at Mobile World Congress within ADI's booth (Hall 2, 2B18) and Marvell's booth (Hall 2, 2F34).

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HANNOVER MESSE: Showcase for Artificial Intelligence

The upcoming tradeshow will be offering special guided tours, a dedicated discussion format and numerous company exhibits featuring AI tools and use cases – from robotics to production cells.

HANNOVER MESSE will be shining a spotlight on the topic of “AI in manufacturing”. Along with the subject of process optimization, exhibitors will be focusing on the role of AI in simulation, testing and product development. Generative AI is also making major inroads into industry.

The only way for industrial enterprises to remain competitive in the coming years is by linking AI to their process automation, warns Prof. Dr. Sepp Hochreiter of the JKU Linz university in Austria. His message to industry: “Don’t screw this one up”. But AI in industry or manufacturing does in fact differ from many other sectors. And this goes beyond the issue of mere data acquisition and processing.

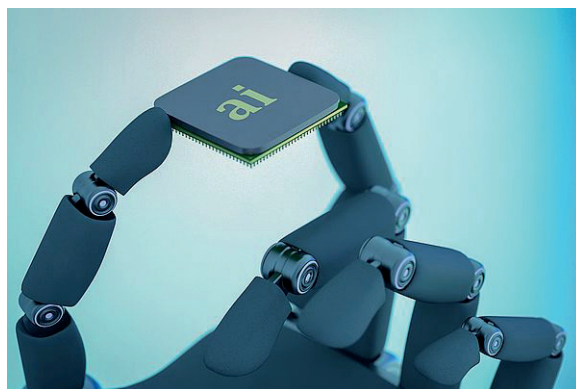
Joint projects to develop AI products and processes for industry

Today, prototypes can often be developed quickly, but the challenge in industrial AI projects – over and above the acquisition and the processing of data – usually lies in integrating the application into a plant, cell, conveyor system or production line. In other words, AI plug and play is rare. HANNOVER MESSE 2023 thus presents the ideal networking hub. This is where AI developers, software engineers get together with users to jointly develop industrial-grade AI products or processes. Whereas in the past, the focus was on use cases in which errors or anomalies were detected or prognostications were made, industry in 2023 is focusing on the optimization of processes and the use of AI methods for simulation, testing and product development. On the second day of the show, the Monolith AI firm will present its solution for simulation in mechanical engineering as part of

the Industrial AI event on the Industrial Transformation Stage in Hall 3. Monolith AI’s approach goes even further than the booming simulation industry. Every simulation performed develops a model, because the creators rely on real-time data. This means mechanical engineering could save on numerous testing procedures. In addition, AI makes suggestions to developers about their products, based on the real-time data. This England-based firm has some very ambitious goals: By 2026, they aim to reduce the product development time of 100,000 engineers by 50 percent. At the same event, machine manufacturer Hawe Hydraulik will report on how it is using reinforcement learning and then implementing the technology in its processes.

Integrating machine learning into processes

Generative AI, for example in the form of the DALL-E tool, will also change the face of industrial product development, with the designer receiving support from an intelligent agent. Festo, the exhibiting company, has been working in the area of reinforcement learning for manufacturing processes for several years. The next step involves the use of generative algorithms for product development. OpenAI recently published 3D models for DALL-E. The challenge in the industry, apart from the 3D challenge, is that the products must also be moveable. In addition to Festo, which is also bringing its new Cobot, Autodesk is also addressing this issue.



The challenge of integrating machine learning into processes is also being addressed by process control suppliers – Siemens is moreover focusing on providing ML Ops, in which engineers provide reliable machine learning models for efficient production and continually maintain them. Siemens will also be providing an insight into an AI project at a customer’s site at the Industrial AI event on the second day of the fair.

In addition, visitors will find AI tools and use cases to draw inspiration on the tradeshow floor. Omron will present a Cell-Line Control System, while Beckhoff will showcase vision solutions and Dürr will feature its DXQanalyze product family. The promise: This enables the comprehensive logging of all available process data to detect potential product quality defects or emerging equipment wear in real time. The system uses data that is condensed at a higher level to draw conclusions about the functionality of individual steps along the value chain, based on documented product quality.

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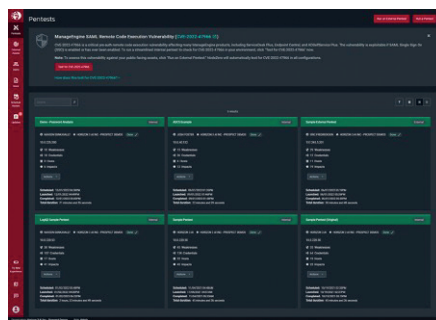


EU Directive NIS 2 in Force: Companies Under Pressure on Cybersecurity

Autonomous penetration testing uncovers cyber vulnerabilities in the shortest time possible



The situation is becoming critical for businesses - the newly enacted European Union (EU) regulation package requires organizations in many industries to stringently protect against cyber-attacks. The directive applies not only to critical infrastructure operators, but to organizations of all types and sizes. "Many companies are still not clear to what extent NIS 2 affects their own operations. The fact is that the law affects practically all companies, right up to the management level. Failures in cybersecurity must be identified and remedied as quickly as possible," warns Rainer M. Richter, Vice President EMEA & APAC at Horizon3.ai. The company has a solution for business, developed by numerous former members of cyber defense teams within international armed forces. NodeZero enables autonomous pentesting - the continuous simulated attack on one's infrastructure without a risk. "Our method of autonomous penetration testing, unlike automated pentesting, is not simply a sequence of tests. NodeZero uses an AI-powered sequence of tests to examine the entire infrastructure and find all exploitable attack vectors. This allows vulnerability to be identified, fixed and rechecked for proper security in



the shortest possible time without relying on the cybersecurity specialists usually required," Richter continued. Professional pentesters, on the other hand, can hardly keep up with their own orders - waiting times are long and will become even longer with NIS 2.

Autonomous pentests bring automated security

The EU's central requirement: IT security is becoming part of corporate management and is thus shifting from the IT department to company management. Organizations must implement risk management and contingency plans. A system for the rapid reporting of incidents to the supervisory authorities will also become mandatory in the future. Autonomous pentesting that can take place while all systems are running also helps: NodeZero from Horizon3.ai offers pentesting-as-a-service, autonomous and user-friendly and thus equally suitable for use in companies and by professional pentesters. Professional reports help to detect vulnerabilities and their remediation. With little effort, the entire infrastructure can be constantly scanned for security issues, Horizon3.ai's model works on three

principles: Find, fix and verify. Potential security gaps that can be exploited by hackers are found, can be eliminated in a targeted manner, and then immediately checked for proper functioning. Furthermore, the continuous verification of the infrastructure protects permanently, while external pentesters usually only play out the attack scenario once a year.

EU roundup for the overall economy

In doing so, NodeZero uses its own European instance for customers in Europe to ensure the highest level of data security. "The level of security that can be achieved in this way is higher than any previous measure. This refers not only to NIS 2 compliance, but also to more efficient protection against attackers. Our algorithms are regularly updated on an extended basis and are therefore always on par with the hackers - regardless of whether they are economically or politically motivated," Rainer M. Richter of Horizon3.ai further explains. For the first time, the NIS 2 directive also includes small companies with at least 50 employees and ten million euros in sales. Often, these businesses have limited resources in the IT department - so automated protection is needed. "NIS 2 affects everyone, from SMEs to the Dax 40," emphasized Iris Plöger, responsible for digitalization at the Federation of German Industries (BDI) at a conference late last year. In addition, organizations face severe penalties: up to ten million euros or two percent of global sales for institutions "with high criticality." Other companies are fined up to seven million euros or 1.4 percent of revenue.

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ELECTRONIC THERMOSTAT AND INDICATOR

Alternative to mechanical thermostats



JUMO offers a high-quality alternative to mechanical thermostats and dial thermometers with the electronic JUMO miroTRON thermostat and the JUMO miroVIEW digital indicator. The 2 devices are available in a modern design in both rectangular and round formats, which makes them suitable for a wide range of applications. Different measurement inputs for RTD temperature probes, thermocouples, and standard signals as well as a digital input make them suitable for use within a wide range of applications. JUMO miroTRON also has up to 4 relay outputs. As an option to the thermostatic function, it can also be used for more demanding control processes. When using the PID two-state controller with autotuning version it delivers a significantly higher control quality. The high-quality, high-contrast LCD display with the option of individually defining message texts ensures optimum readability and a high level of information content about current processes. In addition to the intuitive operation in 4 languages, extensive additional functions such as a timer, limit value monitoring, or digital control signals for simple logical links can be configured directly on the device or with the setup program via micro USB interface. JUMO miroVIEW digital indicators are ideal for displaying important process values on site. They also support additional functions such as min/max display, hold signal, and tare signal for a scale application.

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RAPID SCANNING UV DETECTOR

For high temperature process monitoring



TESTA Analytical Solutions e.K is a technology innovator and specialist supplier of high-performance liquid chromatography instruments and detectors plus a range of non-invasive, real-time flowmeters that are enabling scientists to solve

application challenges faster, more reliably and with greater sensitivity. In addition to its HPLC and GPC/SEC products, the company provides and supports powerful, accurate instrument systems for particle sizing, light scattering, and zeta potential analysis. The company has expanded the capabilities of its rapid scanning UV Detector with a new flow cell designed for high temperature operation. The rugged flow cell employs fiber optic connections to the rapid scanning UV detector to enable it to be safely positioned up to 1 meter away from the high temperature process being monitored. This high-performance UV monitor was originally developed to operate in the heated sample compartment of a high temperature Gel Permeation Chromatography (GPC/SEC) system at temperatures up to 210 °C. The remote flow cell is available in different configurations to enable UV monitoring of analytical to preparative scale processes. This innovative device enables highly accurate remote UV measurements to be made on high temperature process samples that would make direct spectroscopic measurements almost impossible.

►► 63401 at www.iem.eu

COMPACT SPUR GEARHEAD

Helps reduce overall application footprint



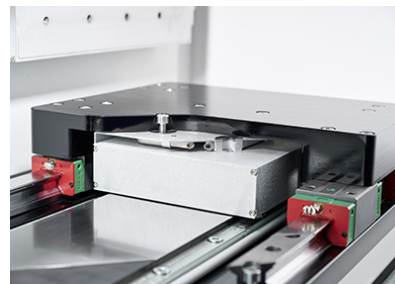
Portescap launches the B16C spur gearhead, one of the latest additions to their gearbox portfolio. The B16C is a compact gearhead that can be directly integrated with Portescap's 16DCT, 16DCP, and 17DCT Athlonix™ brush DC motors. The new B16C

features a rated torque up to 100mNm and a smaller application footprint due to the elimination of certain mechanical components, leading to direct motor integration. The B16C gearbox is an excellent option for miniature applications demanding space savings and compactness, such as ambulatory enteral feeding pumps, miniature pumps, and home infusion pump applications in the Medical Infusion Systems market. Portescap offers a very broad miniature and specialty motor products in the industry, encompassing coreless brush DC, brushless DC, stepper can stack, gearheads, digital linear actuators, and disc magnet technologies. Portescap products have been serving diverse motion control needs in wide spectrum of medical and industrial applications, lifesience, instrumentation, automation, aerospace and commercial applications, for more than 70 years.

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PRECISION COOLER AND STATOR COVER

New accessories for water-cooled linear motors



The linear motor specialist **HIWIN** is expanding the accessories for the LMFA and LMFP series water-cooled linear motors with an LMFC precision cooler and a stator cover. By using LMFC precision cooling,

a significant increase in cooling performance and extensive thermal decoupling between the linear motor components and the machine can be achieved. The heat transfer is then reduced to a minimum. This leads to stable thermal conditions and, with increased continuous load capacity and improved efficiency, promises an absolutely constant production process. Well protected even under harsh environmental conditions, the new sheet metal covers made of stainless steel are available to protect the stators from mechanical damage caused by metal chips, for example. The lightly magnetic stator covers are available in segmented or one-piece versions and are fixed purely by magnetic attraction or additionally by clamping on the end face. The new linear motor accessories are convincing - find out more here now and create the basic prerequisite for your precision machining in temperature-critical applications.

►► 63488 at www.iem.eu



EXTENDED OPC SUITE

Integration of production data from XML files



The new "File Read" function of dataFEED OPC Suite Extended V5.25 from **Softing** enables access to process data available via XML files. dataFEED OPC Suite Extended is an all-in-one solution for OPC communication and cloud

connectivity, providing access to controllers and IoT devices of leading manufacturers. With the new File Read functionality, the suite ensures access to brownfield PLCs, devices and machines that deliver data via XML files. File Read allows process values from XML files to be integrated quickly and securely into production control applications such as MES or OEE via the standard OPC Classic or OPC UA interfaces. The production data can also be integrated into IIoT cloud solutions via MQTT or REST. Furthermore, there is the option of data logging for documentation, analysis, or verification in a separate database. The dataFEED OPC Suite enables access to the controllers of leading manufacturers such as Siemens SIMATIC S7, Rockwell ControlLogix, B&R, Mitsubishi as well as Modbus controllers (e.g., from Wago). It acts as a gateway between the two OPC standards so that existing OPC Classic components and applications can be integrated into modern OPC UA solutions for Industry 4.0 applications.

►► 63490 at www.ien.eu

3D LASER PROFILER

Fast scan rates and wider fields of view



LMI Technologies (LMI) announced the official release of its new Gocator® 2540/50 high-speed wide field of view 3D laser line profile sensors. Gocator 2540/50 laser line profilers deliver the 2500 series' signature blazing fast scan rates, with the added advantage of wider fields of view for greater scan coverage. Engineers can deploy these compact, factory-calibrated

smart sensors in production lines for high-speed 3D measurement and inspection of a variety of manufactured materials including shiny machined-metal EV battery and consumer electronic assemblies, various web materials, hot-rolled rail track steel, as well as low contrast materials such as black rubber tires. "The Gocator 2540 and 2550 laser profilers continue to extend the versatility of our popular high-speed 2500 series. The ability to scan, measure, and control at up to 10 kHz paired with ever wider fields of view opens the door for engineers to deploy this powerful sensor lineup in new inspection applications where speed and maximum line scan coverage are of significant performance advantage", said Mark Radford, CEO, LMI Technologies.

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PROFISAFE ENCODERS

For safety applications



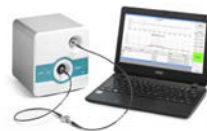
As the next step in the expansion of the new encoder family, **Kübler** presents the new SIL3-certified Sendix S58 PROFISafe encoder. The encoder

transmits up to 15 bits safe or up to 24 bits non-safe, as well as a fully redundant multiturn information of 12 bits safe. Thanks to the platform architecture, this is realized in absolutely the same design as that of the F58 PROFINET encoder. The Sendix S58 PROFISafe is equipped with the latest profiles (PROFINET v2.35 / PROFISafe profile v2.6, PROFIdrive profile v4.2, ENCODER profile v4.2.). The encoder complies with Encoder Class 4 and provides the acquired measurement and diagnostic data via the standard safety telegrams 36/37. With the integrated web server, the new Sendix S58 is 100% future-proof. At Kübler, the Sendix brand has always stood for maximum robustness and reliability. Thanks to the robust bearing structure in Safety-Lock™ design and the high protection class up to IP67, the new PROFISafe encoders are suitable for almost any application. The S58 multiturn encoders are equipped with multiturn gearboxes. Due to the new design, without a classic fieldbus cover, the new encoders are space-saving and therefore ideal even for the tightest installation spaces. Special customer requirements can also be implemented; both on the firmware and hardware side: from special default configurations, additional telegrams, approvals (Ex 2/22), surface protection for extreme requirements, through to optional features.

►► 63485 at www.ien.eu

VERSATILE UV SPECTROPHOTOMETER

For batch and flow applications



Compact in design, the Flow-UV from **Uniqsis** sets a benchmark for real time monitoring of continuous flow and batch applications. Unlike many UV-visible spectrophotometers the high-resolution Flow-UV CCD array detector does not

require calibration or routine servicing. The Xenon flash lamp source used in the Flow-UV has a lifetime of up to 10 years. Steve Evans - Commercial Director for Uniqsis commented "During the last 12 months, one biotech customer ordered 6 Flow-UV units for nucleic acid purity assessment. In a rapidly growing number of pharma labs the unit is being used for high throughput screening of UV-active drug substances and real time determination of the steady state concentration of products being produced in drug discovery reaction optimisation studies. Researchers are also using the Flow-UV for monitoring algal growth, looking at variations of different metal ion complex solutions in rock cores and optimising microporous membrane production to name but a few of the wide array of applications this versatile spectrophotometer was selected for". He added "The Flow-UV uses fibre optic waveguides that connect the flow cell to the detector, allowing the flow cell to be positioned virtually anywhere in the flow path. To assure linearity of response, up to 5 wavelengths can be selected to monitor the progress of a reaction or monitor concentration changes in a wide variety of media."

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Hannover

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Maintenance Next

Rotterdam

www.maintenancenext.nl

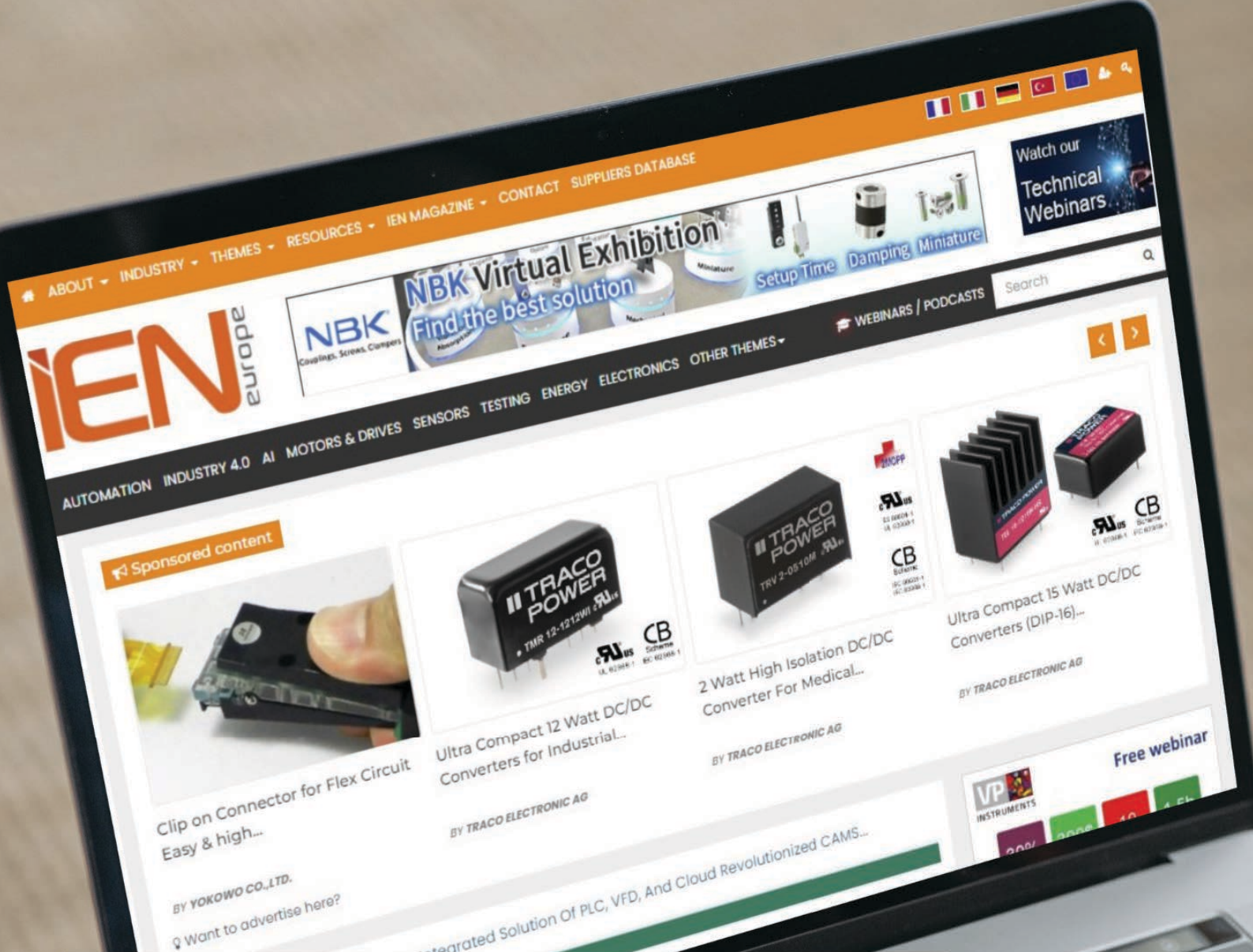
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HANNOVER MESSE 2023

MAKING THE DIFFERENCE

Products and solutions for a sustainable future at #HM23

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