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

First of all, IEN Europe wishes you a Happy New Year! We are hoping that 2022 will be the year of the come back to a more normal situation.

A few signals lead us to optimism. Indeed, some countries and regions in Europe like England, Denmark or Catalonia are reducing restrictions or simply cancelling them, following the goal to continue to live with and despite the virus. Another signal is the return of industrial events with new dates, sometimes postponed later in 2022 or even in 2023. As such, we invite you to look at our updated list of events (see Mediakit). This list will be continually updated as dates are evolving.

With regard to upcoming events, this edition of IEN Europe puts the cursor on two of them, namely HANNOVER MESSE (p9) and the IOTSWC which will take place in Barcelona (p21).

Last, we invite you to take a look at our industry special robotics! This issue sheds light on material handling with a complete guide as well as software implementation as key to success in robotics projects.

We wish you a pleasant and interesting reading

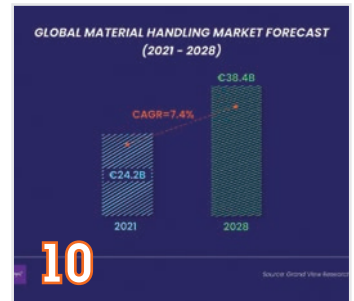
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EtherNet/IP Network Specification Enhanced to Support the Ethernet-APL Physical Layer for Process Automation

Licensed Vendors for the EtherNet/IP technology can immediately start developing EtherNet/IP components for Ethernet-APL, including controllers, power switches, field switches, and instrumentation.

In their Q4 communication, ODVA announced that the EtherNet/IP Specification has been enhanced to enable EtherNet/IP networks to support the Ethernet-APL physical layer for process automation. Ethernet-APL is the new intrinsically safe, two-wire extension of 10BASE-T1L (IEEE 802.3cg-2019) Single Pair Ethernet that meets the requirements of the process industries. The advantages of Ethernet-APL include communication speeds of up to 10 Mbit/s, hazardous area protection, power to field instrumentation, and long cable runs of up to 1,000 meters (IEC 61158-2). Ethernet-APL devices adhere to IEC TS 60079-47 (2-Wire Intrinsically Safe Ethernet) in order to ensure 'intrinsically safe' ignition protection. The Ethernet-APL physical layer overcomes the challenges of using fast, high bandwidth Ethernet at the field level in process plants with hazardous locations and a large geographic footprint.



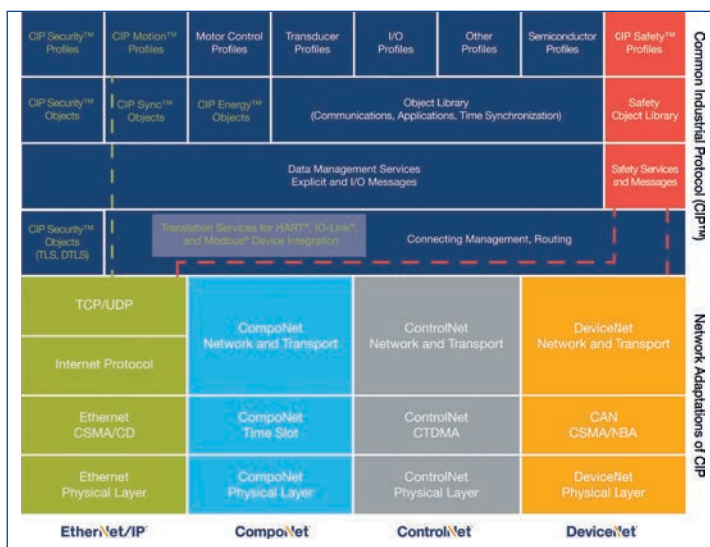
Al Beydoun, President and Executive Director, ODVA

Seamless connectivity from the field devices to the controllers, to Industrial IoT applications

"This announcement is a culmination of many years of cooperative work to bring Ethernet-APL to industry. ODVA is pleased to continue to expand the capabilities of EtherNet/IP for process automation with the inclusion of Ethernet-APL in the EtherNet/IP Specification," said Dr. Al Beydoun, President and Executive Director of ODVA. "With the aid of Ethernet-APL, EtherNet/IP will be able to expand precise, efficient Ethernet-based control and commissioning across field instrumentation. The full use of EtherNet/IP in process installations will enable concurrent seamless connectivity from the field devices to the controllers, to Industrial IoT applications, as well as the edge and cloud for prognostic analysis."

Process automation installations with EtherNet/IP can benefit from network and device health monitoring, built in security and safety, and remote device configuration

The addition of support for the Ethernet-APL physical layer is another key step in the adaptation of EtherNet/IP to meet the full requirements of the process industries. PLCompleted enhancements for EtherNet/IP which benefit applications in the process industries include NAMUR NE 107 diagnostics, HART integration, IO-Link integration, and support for the next generation of digitized device description files, including FDT and FDI. Inclusion of the Ethernet-APL physical layer will allow for end users to take full advantage of the benefits of EtherNet/IP in process plants, including commercially-based industrial control hardware, an object-oriented foundation, and standard internet protocol compatibility including TCP/IP, HTTP, FTP, SNMP, and DHCP. With support for functional safety with CIP Safety, device defense with CIP Security, time synchronization with CIP Sync, and fault tolerant redundancy with parallel redundancy protocol (PRP) and Device Level Ring (DLR), process automation installations with EtherNet/IP can benefit from network and device health monitoring, built in security and safety, and remote device configuration.



Flender Has Passed the Mark of 200 Gigawatts of Gear Unit Power Delivered for Wind Turbines

The drive manufacturer **Flender** has crossed the 200 GW milestone of gearbox capacity for delivered wind turbines with its Winergy product brand. According to the Global Wind Energy Council (GWEC), in 2021 around 743 gigawatts of wind turbine capacity has been in operation worldwide. Winergy holds a share of around 30% in gearboxes within these turbines. Consequently, over 150 million households can be supplied reliably with electricity from renewable sources. "We look with pride at reaching 200 GW. It reflects the great trust our customers have in our products. As a trusted partner at their side, we are working with our customers to create a sustainable future. Power generation from renewable energies plays an important role in this," says Andreas Evertz, CEO of the Flender Group. Flender has helped shape the wind energy industry since its early days. With its Winergy brand, the company has set several trends that are now standard for wind turbines. In 2014, Flender already exceeded the milestone of 100 GW of delivered gearbox power. Through the development of powerful and compact drive systems, this mark has now been doubled, mere seven years later.



Cirdan Launches "Photonics" Certificate, Facilitating Investment into the World's First Photonics Index

The **European Photonics Industry Consortium (EPIC)** announced that **Cirdan Capital Management**, with collaboration from C8 Technologies, has launched a Certificate based on the Solactive EPIC Core Photonics Index. The Index will be available on the C8 Technologies platform for Direct Indexing. With so much of the focus on COP26 around new technologies, photonics is an important technology that will ensure a significant reduction in energy consumption because it utilises light and not electronics. Photonics will deliver more efficient manufacturing at a significantly lower cost and with a much lower impact to the environment. The Solactive EPIC Core Photonics Index is the first of its kind to represent a global cross-section of the world's largest and most liquid public photonics manufacturing companies and includes all companies with at least 50% of their revenues sourced from photonics manufacturing activities. This means that for the first time, investors will be able to specifically target their investments to the photonics industry.



Ziath reports on how its scanners help lower the cost of COVID-19 PCR Testing

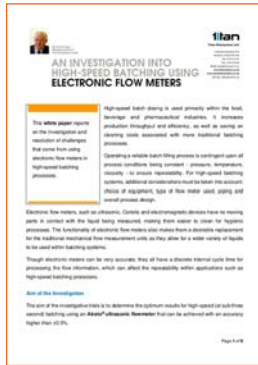
Ziath reports on how its super-fast 2D barcode rack readers are assisting leading COVID-19 testing lab, SummerBio LLC (Menlo Park, California, USA), to provide rapid, low-cost, high-volume testing solutions for educational organizations, employers and laboratories. SummerBio was conceived during the early stages of the COVID-19 pandemic in the USA, to combat expense and slow turnaround times of existing PCR testing. The company was formed by a group of life science automation industry veterans with decades of experience building and operating large-scale laboratory robotics. SummerBio's investment in automating the RT-PCR testing process has enabled them to become one of the top COVID-19 testing labs in California in less than 1 year. Their robotic liquid handling cells use a bespoke 2ml cryotube, developed in Korea, housed in boxes of 100 which allow very high levels of automation to process these racks at speed. Key to this automation is four Ziath Cube 2D barcode rack readers which can image a full rack of 100 tubes and read out all the barcodes in a little over 1 second.





Electronic Flow Meters in High-speed Batching Processes

Titan Enterprises. High-speed batch dosing in filling lines, typically seen within the food, beverage and pharmaceutical industries, is a modern process that increases production throughput and efficiency, as well as saving on cleaning costs associated with traditional batching processes. Historically, small turbine flowmeters have satisfied markets where reasonable volume batching is used, such as beer wall dispensing or ultra-pure water dispensing. These flow measurement devices have excellent response times and are highly effective for low viscosity dosing systems. However, turbine flowmeters do have moving parts within the flow line which can limit the life of the flow device due to mechanical wear and tear. Titan worked with their ultrasonic device, the Atrato®, to resolve these and achieve a cost-effective solution for high accuracy, rapid batch control.



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Adaptive Computing in Robotics

Xilinx. Xilinx's adaptive SOMs are the perfect compute platform for robotics, allowing the creation of software-defined hardware for robots, delivering solutions with increased performance per watt while also being energy efficient, secure, safe, and adaptable. Traditional software development in robotics is about programming functionality in the CPU of a given robot with a pre-defined architecture and constraints. With adaptive computing, instead, building a robotic behavior is about programming an architecture. By leveraging adaptive computing, roboticists can adapt one or more of the properties of its computing systems (e.g., its determinism, power consumption, security posture, or throughput) at run time. Roboticists are not, however, hardware engineers, and embedded expertise is scarce among them. This white paper adopts a ROS 2 roboticist-centric view for adaptive computing and proposes an architecture to include FPGAs as a firstclass participant of the ROS 2 ecosystem.



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Major Hospital in East England Lowers Carbon Footprint with Heating and Cooling Systems

ICS Cool Energy announced the successful delivery of new heating and cooling systems at one of UK's major hospitals located in eastern England. The project, triggered by the hospital's decarbonization initiatives already saves over 95 tonnes of CO2 emissions thanks to the ICS Cool Energy's free cooling installed to cool the MRI scanners. As the next step, the hospital will install Industrial Free Heating (i-FH) system and multipipe chillers to replace the boiler-based heating installation and further reduce hospital's carbon emissions. In the first phase of the project, the hospital was looking for ways to minimize their environmental impact by reducing the carbon footprint of their existing cooling system, used to cool high cooling load areas without hampering their critical infrastructure. To find the right cooling technology, the hospital managers focused on energy efficiency and sustainability, and reached out to ICS Cool Energy for recommendation. Following the analysis of the existing system, ICS Cool Energy's engineering team recommended maintaining the chillers already in place and expanding the system with six new free coolers, from the ICS Cool Energy's IFC (Industrial Free Cooling) range.



Collaboration between ABB and AWS: Digitally Integrated All-electric Operations for Net-zero Emissions Mining



ABB has announced it is working with **Amazon Web Services (AWS)** to accelerate the adoption of new and sustainable technologies in mining. The two companies are now creating solutions for digitally integrated all-electric operations to help meet industry goals on net-zero emissions. ABB and AWS are also proving scalability. AWS enables OMS to ingest, store, process, and analyze operational data from stationary and mobile equipment and dynamically scales to meet the operational demands. The new **ABB Ability™ eMine** approach relies on the reliable and standardized exchange of equipment and process data to effectively integrate electrical and digital systems from mine to port. ABB is simplifying the integration for its mining customers via a collaborative and interoperable approach, leveraging AWS, which removes management and investment responsibilities normally associated with on-premises infrastructure from the customer. With over 130 years of experience in the mining industry, ABB has introduced **ABB Ability™ eMine**, which is comprised of a portfolio of electrification technologies that makes the all-electric mine possible from mine to port and is integrated with digital applications and services to monitor and optimize energy usage. It can be used to electrify any piece of mining equipment across hoisting, grinding, hauling and material handling and the entire process area.

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Albemarle and 6K Sign Joint Development Agreement to Develop Novel Lithium Battery Materials

Albemarle Corporation, specialist in advanced lithium materials, and **6K**, an emerging leader of microwave-controlled plasma technology, announced they have signed a joint development agreement (JDA) to explore the use of 6K's patented UniMelt® advanced, sustainable materials production platform to develop novel lithium battery materials through potentially disruptive manufacturing processes. At the same time, 6K's UniMelt platform promises benefits for sustainable manufacturing. For instance, if a conventional 16-GWh battery cathode production plant was converted to 6K's UniMelt platform, it would reduce CO2 emissions by 70% (equal to 10M trees per year); lower water consumption by 90% (6.3M barrels per year) and reduce wastewater production by 100% (7M barrels per year) while requiring a 50% smaller factory footprint. Furthermore, Albemarle has made an undisclosed investment in 6K through Volta Energy Technologies. An existing financial investor in 6K, Volta is a venture capital firm launched in 2017 that also connects strategic investors like Albemarle with well-researched investment opportunities in the energy storage sector.



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QuantumScape and Fluence to Collaborate on Stationary Storage with Solid-State Lithium-Metal Technology

QuantumScape Corporation and Fluence Energy Inc. announced a multi-year agreement to introduce solid-state lithium-metal battery technology to stationary energy storage applications. The strategic relationship brings together two companies leading in technology innovation focused on accelerating clean energy adoption and reducing global carbon emissions. The companies will collaborate on what they believe to be a first-of-its kind solution to incorporate QuantumScape's battery technology into Fluence stationary energy storage products as specific technical and commercial milestones are met. Stationary energy storage installations are expected to grow by more than 2,000% from 2020 to 2030, representing a \$385 billion global market opportunity. The transition to cleaner energy systems will require cost-effective technologies that increase energy reliability and grid resilience, and better manage demand to cover deficits and prevent power outages. As a leader in stationary storage, Fluence has consistently pioneered new applications for battery-based storage on the electric grid, from replacing natural gas peaker plants to enhancing transmission networks.



HANNOVER MESSE 2022 Rescheduled for Beginning of June

Deutsche Messe AG, in close cooperation with the HANNOVER MESSE exhibitor advisory board and partner associations VDMA (Association of German Mechanical and Plant Engineering) and ZVEI (Central Association of German Electrical Engineering and Digital Industry), has rescheduled HANNOVER MESSE 2022 for May 30 to June 2. The show was originally planned for April. "Due to the continuing high incidence in Germany and many neighboring countries, we decided together with our exhibitors to reschedule HANNOVER MESSE. Last year demonstrated that the summer months are best for major events during this pandemic. Right now we cannot predict if the Covid situation will be better by April, so the new date offers our customers the greatest possible planning security so that they can present their innovations at the world's most important industrial trade show," said Dr. Jochen Köckler, CEO of Deutsche Messe AG. At the beginning of June 2022, HANNOVER MESSE will be the world's first major industrial event. Its focus on digitalization and sustainability will stimulate innovative and efficient approaches to production and climate protection. This year's show runs four days due to the Hannover Exhibition Center's full event calendar in June. In 2023, HANNOVER MESSE will resume its normal five-day schedule in April.



Noesis Solutions Appoints New CEO

Noesis Solutions NV, a majority-owned subsidiary of Cybernet Systems Co., Ltd. and a provider of industry-leading Process Integration and Design Optimization (PIDO) software used mostly in manufacturing and engineering-intensive applications, announces the appointment of Mr. David Franke, Global Sales Director of Noesis Solutions, as its new CEO.



After holding engineering and management positions in the CAE industry with a strong focus on innovation through simulation, Mr. David Franke joined Noesis Solutions in 2018 as Applications Engineering Manager. Since 2020, he has been leading the global sales at Noesis Solutions. Mr. David Franke holds degrees in engineering and business administration and has built a strong professional network over the course of his international career. "I am excited to succeed in the management role at Noesis Solutions. As the industry leader and pioneer of PIDO software, Noesis Solutions is a trusted partner of industries, enabling smart engineering in the field of digital design and manufacturing," says Mr. Franke.



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A Complete Guide to Material Handling

As consumer behaviour keeps shifting further towards online sales, and with material handling being essential for the efficiency of warehouse operations, it is no surprise that the market is expecting to see significant growth during the coming years

The global material handling equipment market was valued at €24.2B in 2021 and is expected to increase at a 7.4% CAGR during the forecast period 2021-2028, reaching an estimated value of €38.4B.

With the increased amount of supply chain disruptions as a result of the Covid-19 pandemic, supply shortages and strong demand expected to be higher than ever due to delays at shipping ports. Retailers are urged to prepare their facilities and material handling process to prevent delays or other issues in their order fulfilment.

What Is Material Handling?

As you may know, material handling refers to the control, movement, and protection of materials and products from the manufacturing process to distribution — in some cases, other in-between processes are included as well, such as transportation and storage. Common material handling equipment includes conveyor belts, robot units, and other automation technologies.

Evidently, material handling is an essential part of supply chain management as it involves both shipping, delivery, packaging, and the movements of goods. It is therefore not surprising that material handling is closely related to processes in warehousing, manufacturing, consumption, disposal, distribution.

The management of material handling is also essential in terms of safety and efficiency. Not only will efficient material handling allow for the proper transferring of materials — thereby preventing wasting any materials — but having proper material handling procedures in place also minimizes

the risk of accidents or employee injuries when handling hazardous products or raw materials.

Generally, we can distinguish between manual material handling systems and automated material handling systems. Let's have a closer look at them.

Manual Material Handling Systems

As the name suggests, this first type refers to the use of manual labour in the process of moving or handling materials. In this case, employees are often found pushing, lifting, pulling, carrying, holding, retrieving, or controlling materials across the facility. Note that in manual material handling systems, facilities still make use of certain equipment such as pallet trucks, short-distance conveyors, forklifts, or manual cranes.

Automated Material Handling Systems

Which material handling system works best for your business depends on a number of factors, such as your initial budget as well as your future plans for your business. If you are thinking about scaling your business, for example, an automated system would be the better option. Essentially, we can divide this process of material handling into four more detailed stages: manufacturing, transportation, storage and warehousing, and distribution.

Types of Material Handling

Material handling equipment for warehouses can be commonly divided into four different categories.

1. Storage & Handling Equipment

This type of equipment is used to opti-



Michelle Schlechtriem, Content Manager at Meili Robots

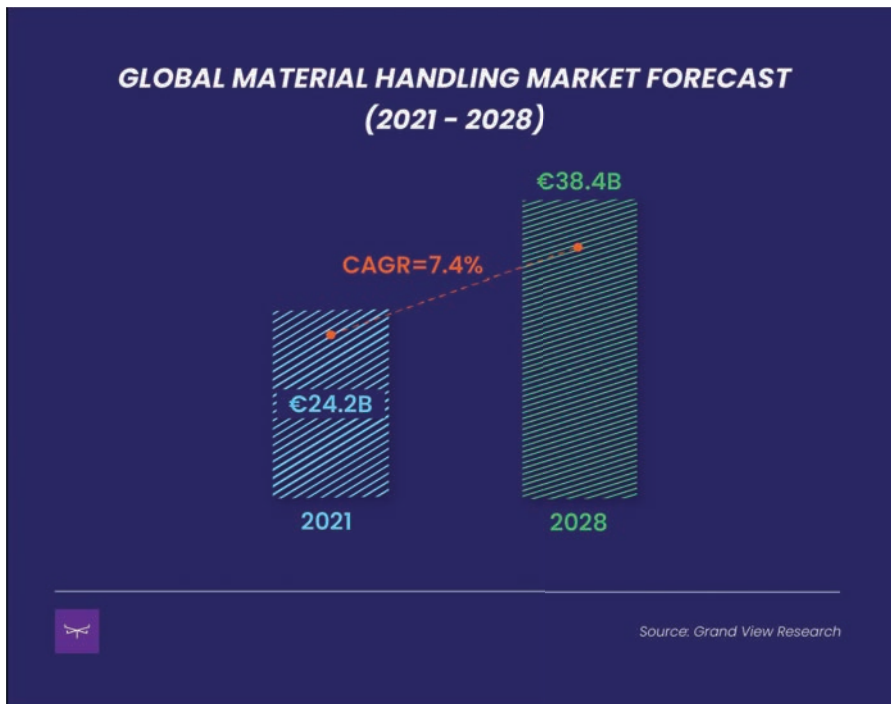
mize warehouse space and increase efficiency on the warehouse floor. It is ideal for keeping warehouses organised, easy to navigate, and accessing and transporting materials of all sizes in a more efficient manner.

Some of the most common types of storage and handling equipment include racks, stacking frames, shelves, drawers and bins, and mezzanines.

2. Bulk Handling Equipment

Bulk material handling equipment is specifically designed for handling and





transporting larger volumes of materials, either in bulk forms or loose — with the latter being the most common.

Common types of bulk material handling equipment include silos, grain elevators, bucket elevators, hoppers, and reclaimers.

3. Industrial Trucks

Industrial trucks can be either motorized or operated by hand and are specifically built to transport pallets and material throughout the warehouse.

Some common examples of industrial trucks comprise pallet jacks, order pickers, side-loaders, and walkie stackers.

4. Automated Systems

Similar to storage and handling equipment, automated systems make the storage, handling, and transportation of materials easier and more efficient — regardless of the size or volume of the materials.

Some of the most common types of automated systems used in material handling include:

- **Automatic Guided Vehicles (AGVs):** An AGV is a type of mobile robot that can move materials around a facility by following fixed wires or markers on the floor.

- **Autonomous Mobile Robots (AMRs):** An AMR is a type of robot that, as the name suggests, can move materials around a facility autonomously — meaning they do not need to follow any specific or predetermined routes.

- **Conveyor systems:** This type of automated system is one of the most popular ones as it can quickly carry large volumes of heavy materials to predefined locations using live rollers, flexible chains, and belts.

- **Automated Storage and Retrieval Systems (AS/RS):** These large, automated structures contain shelves, aisles, and racks, and they are typically used to retrieve items with the use of a mechanised system. They can also be integrated into the facility's network to optimise logistics and stock control.
- **Robotic delivery systems:** These automated systems transport materials throughout the facility to move products onto an assembly line.

How to Optimize Your Material Handling Processes

If you are planning to optimize your material handling equipment and processes, the following four steps can be a useful strategy to follow:

1. Evaluate the Current State of your Material Handling Processes

Before making adjustments and changes to your material handling processes and management, you will first need to understand your company's operations from a data perspective. Relevant data includes the number of orders processed, how many forklifts are used at your facility and their operating costs, and, of course, the overall cost of running your facility per square meter.

Once you have accessed this information, you may be able to make adjustments to avoid unnecessary downtime by, for example, doing regular checkups and maintenance on all of your equipment and monitoring its temperatures. In addition, you need to make sure to have spare parts at hand at all times in case a piece of equipment has a defect — thereby ensuring that your order fulfilment keeps moving.



2. Automate your Material Handling Processes

Automation can be key to minimize the need for manual work and save a lot of time, but it also plays a huge role in reducing your operational costs.

Automated systems are able to respond and predict order fulfilment and the flow of materials, allowing you to be more consistent and efficient in your material handling. Most automated types of material handling machinery come with their own control panel that lets you manage your operations more smoothly and with full control of your material handling processes.

3. Analyze your Storage and Flow

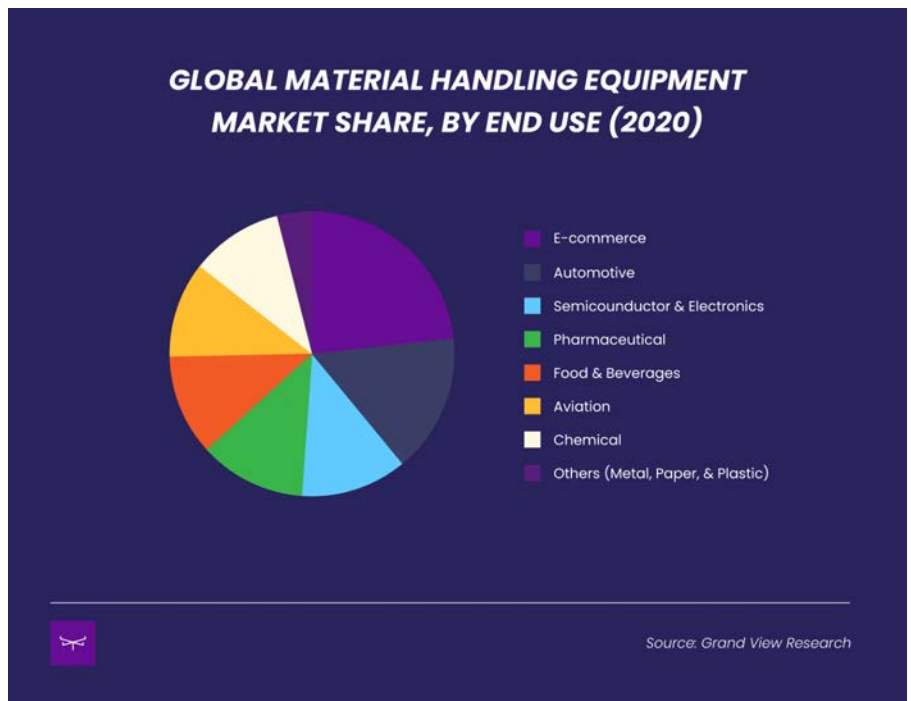
One of the most essential parts of material handling management is the storage and flow of materials. In order to really understand your processes, you need to analyse the movement of material from and to different locations in your facility and how much time each movement takes.

A storage and flow analysis helps to determine the storage space that is needed for your facility. Once you have access to this information, you can decide which solutions would work best for your storage needs, material flow, and the inspection and transportation processes – in other words, your warehouse design.

This analysis will also tell you how many employees are needed to handle both the manual and automated equipment. Keep in mind that storage and the flow of materials go hand in hand, so you need to plan for both of these to work efficiently together as a unit. This will be of great benefit to the quality, cost, and safety of your order fulfilment.

4. Implement an Intelligent Storage System

As the name suggests, intelligent stor-



age systems use Artificial Intelligence to continuously learn and adapt to their environment and ensure that the desired resources are available when needed. This cost-effective system allows businesses to accurately predict and respond to the flow of materials, thereby optimising the management and handling of materials throughout the facility.

The Importance of Navigation & Task Management

Automated material handling systems can be very beneficial for the management of your storage and flow of materials. If you were to add a fleet of mobile robots with, for example, AMRs and AGVs, to your facility – or if you already have one – you need to consider the importance of the fleet's efficiency in terms of navigation and task

management.

For mobile robot fleets to work together effectively and efficiently, it is essential to have a universal fleet management system in place, such as Meili FMS. This allows to optimize operations by enabling equipment – in this case, the mobile robots – to automatically and autonomously respond and adjust to changes in order fulfilment.

To ensure that you make the correct decision or changes to your operations, it is important to conduct a proper analysis of your current material handling processes and, perhaps, consult with a specialist who can help you explore your options.

*Michelle Schlechtriem,
Content Manager at Meili Robots*

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Robotics Projects: Software as Key to Success

Since the market for special machine construction cannot implement the flexible automation solution that Primus Präzisionstechnik needs, the team decided without further ado to implement the robotics project itself.

Artiminds. Since its foundation in 1978, Primus Präzisionstechnik in Bückeburg, Lower Saxony, has built up a good reputation as an independent system supplier for efficient drive solutions. The family-managed company employs 110 people who develop and manufacture special gear units with power ratings of up to 100 watts for customers in the automotive sector, building automation and medical technology.

"We are a solution provider," says Managing Director Thorsten Völz. "An idea service provider, in a manner of speaking, with an affiliated production facility with a high production depth. The in-house options comprise of turning, milling, assembly and all associated sub-processes." The company has been

practicing the much-vaunted Industry 4.0 for many years now, automating and digitizing as many processes as possible with the aim of maintaining a high level of repeatability and process stability, even for large volumes. This is the case with a force-controlled pick-and-place and joining process in which small gearboxes are produced from several individual parts for a customer in the automotive industry: The task here is to fit three shafts and five gears into a gearbox housing. Before placement, the individual parts are also greased. Approximately 250,000 of these gearboxes are manufactured by Primus each year - until now manually. "This is a complex application with many process steps and different components that need to be

assembled into a gear motor, which is later sealed airtight," Völz tells us. "It is therefore vital that all components are assembled completely and correctly. And this is where, unfortunately, people are sometimes the weakest link." To improve product quality and process stability and reduce costs through better dosing of the grease, Primus decided to automate this production step robotically. "We ultimately failed to have a suitable specialized machine built for this purpose," the Managing Director elaborates. The fault lies in the high number of variants and the fact that the intelligence required for the application was not available for the planned budget. "For a standard application, the perfect machine would have been available to us, producing 100,000 parts in a cycle-optimized manner," Völz recounts. "But then, we wouldn't have had any influence on changes, modifications and the different variants." That was not what Primus wanted. "We had to decide on how to proceed," explains Sascha Schwier, Technical Manager at Primus Präzisionstechnik. "Either we design the system completely for accuracy, or we equip it with intelligence so that we can also use it to manufacture other products and reproduce different process steps." A decision was made in favor of the second option. "Our concern with automation was not about optimizing cycle times, but about increasing process accuracy and achieving stable repeatability. Since we wanted to remain flexible in terms of implementation and hardware selection, we decided to start on a greenfield site and tackle our first robotic cell in-house, although we still lacked previous experience in robotics," the Managing Director sums up.



With the help of ArtiMinds LAR Primus is able to take a targeted approach to process optimization and troubleshooting.



During the force-controlled pick-and-place and joining process, three shafts and five gears are fitted into a gearbox housing. Before placement, the individual parts are also greased.

When the software solution is the key

The team first began by procuring the appropriate hardware. "Using sensor technology, we taught the robot to see and feel," says Völz. Primus equipped the robot with a camera and a force-torque sensor. An individual gripper system was added to handle the gears and shafts. The key to the smooth interaction of all parts was the manufacturer-independent software solution ArtiMinds Robot Programming Suite (RPS). "We were looking for a programming environment so that we wouldn't have to touch the source code directly," says Völz. "In the process, the RPS acted as an interface that couples all the peripherals together."

With the software, even complex sensor-adaptive applications can be easily implemented. Users program the robot using drag & drop from predefined templates - the robot code is written independently by the software. In the process, ArtiMinds RPS ensures seamless integration of online and offline programming. In this way, flexible automation solutions can be created and electrical grippers, force torque sensors, image processing systems and PLC communication can be integrated easily. Schwier explains, "For the process to run robustly, the system must be able to compensate for tolerances independently. The only way to achieve this is through intelligent communication between the components. We have practically built our special machine, yet we can still use it flexibly thanks to the algorithms of ArtiMinds RPS."

"ArtiMinds' software solution was a major building block in realizing our requirements," says Völz. "In a classically programmed environment, we would have needed significantly more test cycles and a significantly longer development period." Primus was particularly impressed by the clear and intuitive programming with the software. "ArtiMinds RPS offers many helpful functions that make work



easier, such as the 3D simulation environment or the ability to switch back and forth between online and offline mode depending on requirements," lists Michael Castien, Robot Programmer at Primus Präzisionstechnik. "The very big advantage is that I can use a single platform to harmoniously integrate and control all com-

ponents and sensors such as robots, cameras, force-torque sensors, grippers and motors in the process. The RPS simplifies this step and provides a uniform programming structure." When it comes to solving tricky challenges, the software can also provide quick and easy help with its wizards. "ArtiMinds RPS is a bulging toolbox, so to speak," says Castien. "With the provided tools we were able to quickly and safely reach the desired result, as with the spiral search function for instance." This function block provided in the software's template library enables the robot to conduct a force-controlled search for the insertion and joining location for the gears and shafts. "When there was no template available for a required function, the ArtiMinds support team quickly helped to find a solution without complications," says Castien.

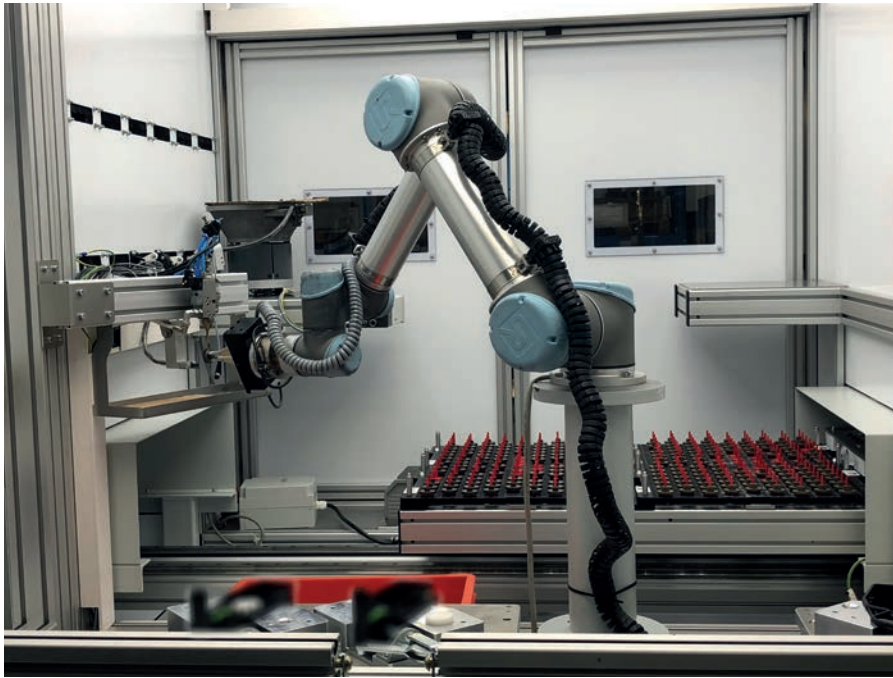


Analysis, optimization and remote maintenance with ArtiMinds LAR

To keep an eye on the plant during operation, Primus uses another product from ArtiMinds: the Learning & Analytics for Robots (LAR) analysis software. This software provides detailed evaluations and data about the production process. "The

The function blocks provided in the software's template library enable the robot to conduct a force-controlled search for the insertion and joining location for the small parts





To improve product quality and process stability and reduce costs through better dosing of the grease, Primus decided to automate this production step robotically

Castien also sees this as a major advantage: "There is always a kind of demonstration effect when troubleshooting. Once you are standing in front of the system, the error no longer occurs. With LAR, I can automatically record all the data and, thanks to the seamless documentation, isolate errors within a short time." In addition, optimization potential that would not be visible to the naked eye can be easily objectified. Castien explains, "We have two robots with the same program. The analysis data from the LAR showed that there are still differences, though, and contrary to our assumption, the two systems don't run the same." Using this data, Castien was able to readjust the precision to within 100ths and, after a few runs, re-evaluate whether or not the changes had the desired positive effect.

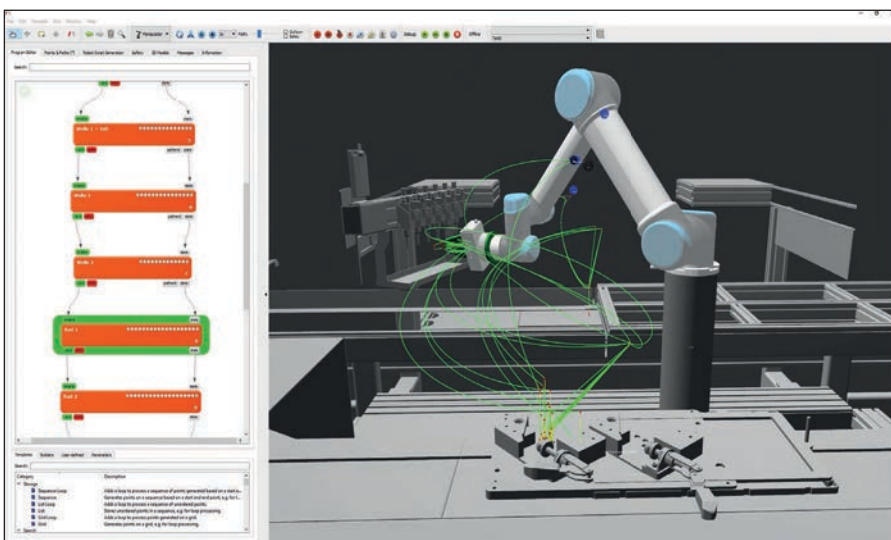
information is based on robot movements, force-torque measurements, image processing results or error codes," explains Raimund Hartelt, Senior Business Development Manager at ArtiMinds. "These are collected automatically and stored in the database. Enriched with process information from the RPS templates, Primus can interpret the data in a goal-oriented manner with a direct view on the task to be solved and derive optimizations. Moreover, be-

cause different users need different data and KPIs, everyone can tailor their dashboard to their exact requirements."

On one hand, Primus uses LAR for process monitoring and fault detection or analysis, on the other hand also to convert process stability into key figures. "ArtiMinds LAR enables us to take a targeted approach to process optimization and troubleshooting," says Schwier. "This eliminates the need for fishing in the dark."

Cooperation at an equal level

With the software solutions from ArtiMinds, Primus Präzisionstechnik was in a position to implement that flexible robotic cell that the company needed for the fully automated assembly of the small gearboxes. "We achieved our goal and were able to increase the process quality from about 90 to almost 100 per cent," Völz states with satisfaction. "Furthermore, the system gives us high flexibility since we can adapt it to new tasks or changed conditions without much effort, i.e. reprogram it independently. In addition, the robotics know-how built up as part of the project provides us with a major competitive advantage!" The gear specialists were also impressed by the trusting cooperation at eye level. "We grew together on the tasks," says Castien. "When there were challenges, we worked out solutions and ways in partnership. And we still have intensive exchanges, for example, to extend the preparation of LAR's analysis data to our needs, as we are currently doing."



In the 3D simulation environment of ArtiMinds RPS, the application can be tested in advance, checked for collisions and reachability, and individual processes such as greasing and joining can be visualized.

*Silke Glasstetter, Head of Marketing
at ArtiMinds Robotics*

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Maintenance of Ageing Plants

Robert Stancombe of Mobile Water Services part of Veolia Water Technologies, considers how production security can be at risk if water treatment fails.

Veolia Mobile Water Services. Across Europe in heavy industries like Power, Chemical, Petrochemical and Refining, operators are facing an increasing challenge from their ageing assets including water treatment plants. The HSE cites the potential degradation of plant and equipment due to age related mechanisms such as corrosion, erosion and fatigue as a key issue for industry. In addition to safety concerns, ageing plants may also impact continuity of production. This can be seen in permanent onsite water treatment facilities. Water is a vital utility in many heavy industry processes and the demand for it is increasing with population and industry growth. Ageing plants are not always reliable or efficient and often emergency maintenance is required to avoid disruption to production which could result in costly downtime for operating sites.

Emergency provision of temporary water treatment is well established and Veolia Mobile Water Services are well placed to meet these urgent requirements. However, more and more operators are recognizing and seeking the

need for a more “permanent temporary” solution. Mobile water service providers can also bridge a gap for operators with a problematic plant until it can be replaced or repaired or even to bridge a time period if there are variations in feed water supply or quality.

Operators across several industries in Europe have worked with temporary water treatment service providers to provide a flexible longer term solution to tackle the reliability issue around the permanent ageing plant and even extend its potential life cycle. Preventative maintenance and refurbishment of a permanent water treatment plant needs to be carried out more frequently without interrupting the production schedule and not during a planned shutdown. A temporary water treatment system may be deployed to either provide the full replacement or partial part of the various processes during this interim need. Typical applications include resin replacement, pressure vessel maintenance, controls upgrades, reverse osmosis membrane cleaning or replacement, maintenance on chemical dosing equip-

ment and work on waste treatment plants.

Longer term asset rental is now an attractive alternative to high upfront investment in permanent water treatment technology across many sectors. Tightening CAPEX budgets, an emphasis on business continuity and a desire for flexible, affordable water management, have all generated a demand for mobile water services, which offer a cost-effective, alternative solution to procuring new installations for upgrading existing infrastructure, as well as providing emergency relief and fulfilling temporary water requirements.

An evolving solution

A typical mobile plant may consist of two or three assets or skid-mounted systems, which can be assembled in a plug-and-play fashion. A typical set-up involves initial pretreatment by multi-media filtration or granular activated carbon adsorption, followed by reverse osmosis in a second trailer, and subsequent mixed bed ion exchange polishing in a third.

The modular design of many of today's mobile





water services allows a variety of process configurations to be combined, making it possible to treat towns' mains, borehole, river and reservoir water, and even wastewater resources. The containers' portability enables them to be positioned to make the best use of the available space, eliminating or reducing the need for building infrastructure to house the equipment. Any number of assets can be operated in parallel or in series to provide the required flow rate, and their modularity allows additional components or treatment steps to be added for extra functionality or increased throughput, even if it is only needed for a short period of time. Storage tanks and pumps can also be provided – together with interconnecting fixed pipework or flexible hoses, water meters and fittings – and mobile generators support a completely standalone set-up. A final, and perhaps the most important, consideration is that these modular units can be easily exchanged over time for the latest, updated technology, ensuring that a company's water treatment systems remain at the cutting edge and benefit from the most cost-effective, available solution from its mobile water services supplier.

CAPEX considerations

Plant operators face a number of current challenges. Environmental targets, changes in production demand and tightening budgets have all made it more difficult to make a strong case for capital investment. The fallout of this has been a reluctance to invest in projects where the lifetime and return on investment are uncertain. In light of this, one of the attractions

of mobile water services is their flexibility, as the rental payments can be covered by the operational budget, removing the need to raise capital. Mobile water service suppliers – such as Veolia Water Technologies – are often willing to enter into pay-as-you-go, multiyear contracts, which help to improve financial planning thanks to predictable, regular payments.

Planned maintenance and turnarounds

A temporary water treatment system is a perfect solution in an emergency and can sustain a continuous supply of treated water for all unanticipated scenarios, such as coping with short-term demands. However, many facilities will also need to plan for maintenance of existing water systems, and mobile water services can be brought in to cover equipment servicing, ensuring that production or business processes can continue and avoiding costly downtime. In some instances, a facility may need to cope with seasonal or unexpected changes to its raw water supply.

Scheduled turnarounds may involve a total suspension of operational activities. A turnaround that exceeds its timeline or budget can have serious financial consequences, so it is essential that an efficient, reliable water supply is available as needed. In these instances, mobile water services can be brought in to support all maintenance and cleaning activities, as demonstrated by the experience of another multinational oil and gas company. A turnaround had been scheduled and, during the subsequent start-up phase, the refinery needed an extra back-up supply of demineral-

ized water – 100 m³/h in operation and 100 m³/h in standby – running in parallel to its own demineralised water plant. Veolia Mobile Water Services provided a four-trailer configuration to guarantee the water supply and meet the water specifications, including a conductivity of <0.1 µS/cm and <10 ppm of SiO₂. This short-term intervention offered a reliable and secure back-up and, as a plan and agreement was already in place, Veolia Mobile Water Services was able to offer fast deployment and commissioning.

Awareness is key

There are numerous benefits that mobile water services can bring to industrial manufacturers facing the challenge of ageing plants. Raising knowledge and awareness is key for mobile water services suppliers over the next couple of years. A distinct shift in outlook is necessary to help companies to transition from seeing temporary water services as only an emergency service provider, to understanding the value in a longer term solution to an ongoing issue. Mobile water services represent a sensible alternative to capital investment. As awareness grows, we can expect to see more mobile water services being implemented, supporting financial planning, ensuring business continuity and helping to maintain resilient and effective water treatment plants.

*Robert Stancombe, Mobile Water Services,
Veolia Water Technologies*

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Top 5 Digital Transformation Technology Trends for 2022

What's on the way next year in digital transformation? Olivier Helterlin, VP Sales – France, Benelux & Switzerland, and Managing Director of PTC France, highlights the five digital transformation trends to keep an eye on in 2022.

1. Importance of Substantial Investment in Digital Transformation

Executing a successful digital transformation initiative is no easy task. McKinsey's mid-year digital transformation survey found the companies that make significant investments in technological capabilities, talent, leadership and resources reap the benefits. The top-performing decile of survey respondents were well ahead of their competitors in all four of those areas: one example is the top 20% are twice as likely as others to say they fill key technology roles with high-quality talent in a timely manner.

The results of McKinsey's survey track with what we've heard from customer as well: 77% of digital transformation programs spend over \$1 million and 30% spend over \$5 million annually. These efforts involve collaboration between technology leaders, strategic leaders and functional leaders, along with many others. Successful digital transformation is challenging, but with the right and focused vision, appropriate resources, a dedicated team and a clear implementation strategy, the payoff is exponential.

2. Benefits of Precisely Focused Digital Transformation

Digital transformation is such a broad proposition with so many dimensions that plenty of companies struggle with step one: where to start? Some opt to simultaneously tackle multiple challenges, often to their detriment. On average, manufacturers start with eight digital pilot projects but 75% of those fail to scale, which can call into ques-

tion the program's longevity and funding and damage competitiveness.

While this mix approach may make intuitive sense because DX initiatives take many different forms and take time to payoff, pilot purgatory is the unfortunately typical end results. With too much to consider, decision fatigue and analysis paralysis set in and the initiatives flounder. Companies that identify their most pressing problems, gauge the benefits of resolving them, invest confidently and execute effectively will be rewarded for it. In addition to external expert advice, the key to a successful digital transformation initiative is close collaboration between the business functions impacted by the changes and the IT departments to determine their critical needs.

3. Advantages of Employee Digital Experiences

Accenture's recent research report « The future of work: a hybrid work model » found that most workers (83%) prefer an approach where they can contribute onsite or off. That makes perfect sense, given many employees have grown accustomed to such flexibility over the past couple of years. With the report also finding that 63% of high-growth companies have already adopted a « productivity anywhere » model, the onus is on employers to ensure that their workforce is equipped with the proper resources and support to be successful.

Digital-first and connected experiences that increase productivity and retain talent will serve as a significant competitive advantage for companies. Augmented reality is already being utilized in everything from training



Olivier Helterlin, VP Sales – France, Benelux & Switzerland, and Managing Director of PTC France

the US Air Force to assisting with industrial machine. Companies have seen the savings from reduced travel expenditures over the past two years. Why not continue?

4. Growth of generative AI in digital transformation

As Gartner observes when looking ahead toward next year's top tech trends. Generative AI is one to watch. Generative AI « refers to machine learning methods that learn about content or objects from their data and then use that information to generate brand-new original artifacts », according to Gartner.



This capability is already a part of existing digital transformation programs and will become more integrated as the technology matures by 2025. Gartner expects generative AI to account for 10% of all data produced, up to from less than 1% today.

As machine learning continues to make strides, one area where it already provides significant value is design. Using generative design, engineers can iterate on new ideas quickly and creatively, letting software guide them to novel and more sustainable solutions. Today, this technology shapes a variety of products, including cars on the road and suits in outer space. As time goes on, it will play an even more prominent role in how companies engineer and manufacture the next wave of products.

5. Increasing Pace of Change and Customization in IT Infrastructure

Uncertainty reared its head in an especially ugly way during the past couple years. In a Deloitte article on strategy and digital transformation, more than three-quarters of executives surveyed said they expect more change over the next five years than there was in the previous five. More than half of that cohort believe the rapid pace of technology is “not good” for their organizations or customers.

Having the ability to adjust on the fly will be table stakes to compete. What’s also likely, as companies chart different paths to accomplish their goals, is for the combination of on-premise and cloud to turn into on-premise and clouds. SaaS is on the

march because it provides greater mobility, better collaboration, faster innovation, simple scalability and a lower total cost.

The evolution of hybrid cloud to multi-cloud and SaaS will help businesses better meet their IT needs, favoring partners that can provide these types of services and integrate them seamlessly.

Technology is the lifeblood of digital transformation and both will keep pushing ahead in 2022.

Keeping the above trends in mind will help companies pursue successful digital transformation initiatives and position themselves for long-term success even as the ground shifts.

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The Chaos of Legacy Equipment: How to Manage a Complex Network of New and Legacy Equipment

Legacy equipment is vital to the functioning of many manufacturing facilities. Nevertheless, with rapid advancement in automated and connected technologies, managing both new and old equipment simultaneously can be a challenging balancing act.

Johan Jonzon, CMO and Co-Founder of pioneer in edge analytics for the industrial Internet of Things (IIoT), Crosser, shares insight into how manufacturers can successfully manage data from both new and legacy equipment.

It’s common for industrial facilities to contain both new, digitalized equipment and legacy equipment that has not been designed with connectivity in mind, other than maybe to the local control room or local dashboard for the operator. Afterall, plant

managers are unlikely to dedicate funds to upgrading to the latest model when a piece of legacy equipment is running with no problems.

Therefore, it’s normal for businesses to only invest in the new pieces of technology that are needed, finding ways to integrate them into the existing system. In addition, as businesses expand, it’s common for them to acquire new sites. Having a mix of old and new sites can add even more complexity into the mix, making it very difficult to streamline

and unify data from all the different locations and pieces of equipment.

Retrofit IIoT devices

While legacy equipment may have been manufactured before the rise of IIoT, it can be given similar capabilities by retrofitting. This is also known as ‘wrap-and-extend’, where the device ‘wraps’ the piece of equipment with functionality and connectivity, therefore extending its reach in a number of ways. By updating the piece of equipment





and increasing its functionality, the manufacturer also extends its life. This is because the machine can fulfil the company's production requirements for a longer period of time before an upgraded replacement is needed.

To gather data on equipment performance, sensors that measure vibration, temperature, or other parameters can be installed. Devices that are retrofitted onto legacy equipment can include Open Platform Communication (OPC) servers, IoT platforms and IoT gateways, which enable communication between new and legacy equipment.

Embrace the edge

Giving legacy equipment the ability to collect data offers one solution, but managing that data and attaching meaning is where the next challenge lies. We must first consider that a network comprised of many pieces of new and legacy equipment creates a massive amount of data. The bandwidth necessary to transmit that data to the cloud for storage and analysis can be expensive. This can be mitigated by edge analytics, which can act as a bridge between devices and the cloud, providing a local source of processing and storage.

Edge analytics can collect and filter data, storing or sending it to the correct location

based on business rules. This means only the necessary data is sent from the edge to on-premise systems, such as a manufacturing execution system (MES) or enterprise resource planning (ERP). Data-reduction offloads the on-premise systems and reduces the amount of data that is transferred to the Cloud, saving Cloud and bandwidth costs.

Edge analytics is also capable of conducting down-sampling and summary analytics, which can further reduce the size of the data that must be sent to other areas on-premise. Machine data can be transformed by edge technologies into a common language that is understood by all equipment and devices in the facility, ensuring smooth communication.

However, handling a number of devices, a large amount of data, and a variety of different software and systems can soon become incredibly complex. In an area that can cause a cloud of confusion, it's important to work with a solution provider that can simplify implementation and management of IIoT devices.

Strive for simplicity

The Crosser low-code platform for streaming analytics, automation and integration for the IIoT was designed with simplicity in mind. Crosser's Flow Studio, which is part of the platform, makes system programming easy

for employees. The Flow Studio consists of a number of pre-built modules that can be dragged and dropped to easily construct data flows without any formal training or coding knowledge required.

The combination of modules created can be tested in a 'sandbox node' or on a live edge node before widespread distribution. Once satisfied with the data flow, it can be deployed across an unlimited number of edge nodes in one single operation. The Flow Studio is designed to empower collaboration between users, such as automation engineers, IT teams and data scientists, and is developed to be simple and intuitive to use. IIoT devices are on the rise, but that doesn't mean old equipment is being left behind. Many facilities rely on a mix of new and legacy equipment, and these systems must be managed effectively to ensure seamless communication and complementary operation. Companies can make the most of a diverse system by retrofitting IIoT devices onto legacy equipment, and using a simple edge analytics platform to process and store all of the data collected.

*Johan Jonzon,
CMO and Co-Founder, Crosser*

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IoT Solutions World Congress: the International Meeting for the Leaders in Digital Transformation

IOT Solutions World Congress (IOTSWC), the largest international event dedicated to industry transformation through disruptive technologies, will return to Fira de Barcelona's Gran Via venue from May 10 to 12 2022.

In its sixth edition and under the theme Game-changing technologies for industry transformation, **IOTSWC** will gather the leading suppliers of industrial solutions and information technology providers to showcase the latest trends that are providing an edge to companies across many industries and promote collaboration in the tech solutions ecosystem.

Organised by Fira de Barcelona in partnership with the Industry IOT Consortium® (IIC™), the 2022 edition of IOTSWC will structure its congress program around five themes: Business optimization, Artificial Intelligence, Connectivity, Security and Customer Experience. The conferences and sessions will focus on use cases that provide clear examples of how disruptive technologies are changing businesses and transforming industries. Among the confirmed speakers are Airbus, Bühler, Dow, Johnson & Johnson, LEGO, Nestlé, PCL Construction and Volkswagen.

Five months before the event, IOTSWC has confirmed over 100 exhibiting companies including ABB, Altair, EMnify, Fiware, Hornet Security, Huawei, Kaspersky, RFPD, Relayr and Siemens. All of them will showcase examples of how the Internet of Things, Artificial intelligence, Digital Twins, Blockchain and other technologies have the potential to transform entire companies and businesses.

The Director of IOTSWC, Roger Bou, says: "IOTSWC 2022 will be a critical milestone for the ecosystem of business transformation technologies. After two years of being apart, companies, thought leaders and innovators will finally be able to get together. This will surely provide a much-needed push to re-launch collaboration and joint initiatives in a



field where multi-actor projects are key in the development of new solutions capable of being scaled worldwide."

Along these lines, IIC Executive Director Dr. Richard Soley emphasises the practical focus of the event, which showcases not only the latest advances in the IIoT but also in the enabling technologies that are driving the transformation of multiple industry sectors. "IOTSWC aims at companies who are looking to leverage emerging technologies. At the event they will not only be able to learn from fellow users about how they have successfully adapted and implemented some of them, but they will also be able to see at our exhibition floor some of the most innovative trials being conducted worldwide."

Testbeds

Providing tangible examples of successful combinations of these technologies is also key to driving innovation. In 2022, IOTSWC will bring back the testbed area that has become a trademark of its own. Submission for testbed proposals is open until January and all

entries will be reviewed by a jury comprised of industry leaders. Announcement of the 10 selected entries that will be showcased at a central location within the exhibition floor will take place in early February. Testbeds are experimentation platforms deployed and tested in an environment that resembles real world conditions and shows how new services can be developed and deployed.

Barcelona Cybersecurity Congress

Cybersecurity has become a critical field within the technology landscape as an essential layer for every solution. To underline this importance, the Barcelona Cybersecurity Congress, an annual event co-organized with the Catalan Government, will be jointly held on the same dates as the IOTSWC. The event brings together the main cybersecurity agents and experts and aims to analyze the current challenges in this field, defining patterns to protect against cyberattacks at a sectoral level, and presenting real solutions, tools, and success stories to extend the culture of cybersecurity across all industries.

IOTSWC and ISE Partnership

IOT Solutions World Congress (IOTSWC) and Integrated Systems Europe (ISE), the world's leading professional audiovisual (AV) and systems integration show, have agreed to join forces this year and provide an unparalleled ecosystem for digital transformation to professionals from many industries. IOTSWC and ISE will be held at Fira de Barcelona's Gran Via venue on May 10-12 and 10-13 2022, respectively.

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COMPACT AC MULTIDRIVE

Flexible and scalable multidrive performance



Inovance Technology Europe has announced the release of the MD800, with a modular design that enables up to 8 drives to be supplied from one rack with a single rectifier, sharing energy

through the common DC bus. The product provides comprehensive functionality including an individual STO (safe torque off) on each drive, the ability to control PM and induction motors from a single software package, a +24 VDC control backup supply, and a full range of fieldbus and I/O expansion option cards. Meanwhile, the dual rating of each drive module allows heavy duty 150% overload for demanding torque applications or normal duty 110% overload for fan & pump applications. Installation costs are diminished as a result of user-friendly pluggable, spring type connectors, and a faster build time due to reduced wiring and fewer external components.

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STREAM 4 X CAMERAS

With Quartet TX2 Embedded Solution



The Quartet TX2 carrier board from **Teledyne FLIR** enables streaming of 4 x high performance USB3 board level cameras simultaneously and at full bandwidth. Ideal for space constrained applications, it eliminates the need for peripheral hardware and host systems. The Quartet TX2

Embedded Solution comes pre-integrated with Teledyne's Spinnaker SDK, delivering a turnkey solution with scalable performance options. The Quartet TX2 carrier board combines power and data transmission over a single cable per camera; for a very compact footprint of 138mm x 92mm x 18.2mm. Integrators can now design compact vision systems using the tried and tested TX2 module, easily integrating a powerful single board computer (SBC) into space constrained vision systems.

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CONNECTORS FOR INDUSTRIAL SPE

New series compliant to IEC 63171



Y-SPE from **Yamaichi Electronics** is a new series of connectors that initially includes both IP20 sockets and M12 sockets with IP67 protection for PCB mounting in accordance with IEC standards 63171-2

and -6. Single pair Ethernet offers the possibility of efficient data transmission from the sensor to the cloud. The increasing need and ability of machines, devices and also components in the production environment to communicate poses challenges to the previous Ethernet. Especially for systems with cable distances >100 m, there were only few possibilities in terms of Ethernet. Due to the large range and the uniform communication level, single pair Ethernet is therefore generally considered the key in the transition to IIoT and Industry 4.0. Transmission takes place via only two and no longer via four or eight contacts.

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HD LENS FOR AVIATION APPLICATIONS

Optimized for use in H-head-up D-display (HUD) systems



Lenses for today's HUD system are more likely to be used to capture images of the pilots view out of the cockpit with the symbology overlaid on the final image as opposed to the lens looking through the combiner and capturing the symbology at the same time as the pilot's view. No

matter which technology is used there is still the issue of each aircraft type needing a different field of view (FOV). **Resolve Optics** designed a small compact zoom design that covers the majority of the aircraft that require HUD system recording. The zoom design can be used to set the lens at a desired FOV and locked. Resolve Optics HD HUD lens has been designed and tested to withstand the high levels of vibration, shock typically found in aircraft.

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4:1 INPUT VOLTAGE 60 W DC/DC CONVERTER

High power solution for medical applications



Traco Power provides the THM 60WI series as a range of medical 60 Watt DC/DC converters in a compact 2.3" x 1.45" plastic package and with wide 4:1 input voltage range. They offer a reinforced

isolation system (5000 VAC) and a very low leakage current of less than 4.5 µA. With a high efficiency of up to 92% and highest-grade components the converters can reliably operate in an ambient temperature range of -40°C up to +75°C with derating. For more demanding applications in regards with temperature, Traco also offers a special heatsink which greatly increase the thermal capabilities for natural convection conditions. The units are approved according to IEC/EN/ES 60601-1 3rd edition for 2 x MOPP as well as IEC/EN/UL 62368-1 and come along with an ISO 14971 risk management file.

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HIGH RESOLUTION SINGLE TUBE READER

Sample management with 2D barcoded tubes



Measuring just 66 x 53.5 x 51.5 millimetres, **Ziath's** rugged new tube reader comes with a high-resolution camera with super-fast electronics capable of reading 2D barcodes from any currently available tube on the market including 384-well tubes. The Uno single tube reader also has an optional

capability to read Brooks Acoustix™ tubes. The reader can be supplied with or without optional cryoprotection to enable trouble-free scanning of tubes taken straight from cold storage. The USB 3 device acts as a Microsoft Keyboard Wedge and inserts the barcode into any open programme on the desktop. The enhanced drivers allow the Uno to be ready to read immediately with no lag time and even allow adjustment of the camera for changes in contrast between different manufacturers tubes.

►► 61649 at www.ien.eu



OIL-FREE SCREW AIR COMPRESSORS

For Food & Beverage and sensitive industry operations



ELGI Compressors Europe announced the expansion of its AB Series of oil free screw air compressors range with the introduction of the AB11-22. The four new air compressors denominated as the AB11, AB15, AB18 and AB22, expand this AB Series portfolio for smaller

compressed air application needs but with the same design and reliability of the large units. The whole 'Always Better' AB Series, from 11KW to 110KW, brings a disruption in oil-free compressed air technology. A no-compromise oil-free solution at reduced lifecycle costs when compared to prevailing oil-free technology, reliability and lower maintenance costs and class zero certified, contamination-free air for sensitive industry applications. The new range fits the use for the food and beverage, small pharmaceutical and the dairy industry, as well as small electronics productions, and laboratories where compliance with stringent norms of ISO 8573-1 Class 0 and ISO 8573-7 air that is free of microbiological contaminants is crucial. In addition, the AB11-22 range provides savings in energy, efficient moisture separation, a smart cooling system and an optimal capacity control which leads to direct savings on power consumption.

►► 61645 at www.ien.eu

WIDEBAND INFRARED BEAM SPLITTER

Engineered for military testing



The Defence Systems integrator awarded the contract to design and build the interferometer selected **Optical Surfaces Ltd** as their optical supply partner for this project because of their track record in producing complex, high precision optics. Required for testing the quality of infrared optical components, the

Michelson type interferometer design was optimized for multi-wavelength operation in both the mid and far infrared. Dr Aris Kouris, Sales Director at Optical Surfaces Ltd. commented "The beamsplitter is one of the most critical components of an interferometer as it divides a beam of light into two distinct paths and then recombines the two beams after introducing a difference in the two paths. Operating in a uniquely stable manufacturing environment our team of experienced optical craftsmen were able to produce an ultra-high precision finish ($\lambda/20$ p-v) on all surfaces of the beamsplitter. However, to produce the multi-wavelength operation required a big stack of dielectric coatings on the partially reflective side of the beamsplitter which caused the surface form to be distorted. To overcome this challenge - we quantified the amount of costing induced distortion and then applied the opposite amount of distortion when recoated to produce the required high performance optical form".

►► 61618 at www.ien.eu



FREE DIGITAL SUBSCRIPTION

SELF-REGULATING HEAT TRACING CABLE

Secures independent UL verified mark



nVent Electric plc announced it is the first heat tracing cable manufacturer to secure third-party verification of a product's long-term power retention capabilities. Underwriters' Laboratories (UL) recently verified the performance of the nVent RAYCHEM HTV self-regulating

heating cable to retain 100% power output following 18 months of intensive, continuous testing at the product's maximum operating temperature of 205°C (400°F). This announcement marks the first time the international certification agency UL has verified a heat tracing product's performance over such an extended period. Regulatory standards typically focus on validating a product's safety status and short-term performance, but there are currently no regulatory requirements for heating cable longevity or power retention beyond the first few months of operation. nVent combined the recent nVent RAYCHEM HTV heat tracing cable test data with 3D Arrhenius modelling techniques to establish concrete lifetime ratings for its heating cable. Based on these ratings, the nVent RAYCHEM HTV heating cable sets a new standard in heat tracing performance, offering a minimum of 95% power retention after 10 years and a design life of 30 years. This solution is reliable to protect temperature critical operations. Consistent power retention is critical for ensuring plants and facilities can cope with most unexpected scenarios, such as extreme weather conditions.

►► 61544 at www.ien.eu

MINI-PCS WITH BROAD TEMPERATURE RANGE

Can operate at a temperature range from -20° C to +60° C



Polywell Computers, true to its principles of reasonable pricing ensuring optimal price/quality ratio, announces the start of supplies to the Russian market of mini-industrial class PCs with extended temperature range, whose price tag is not capable of causing fainting for enterprise purchasers and system integrators. For instance, the

Nano-U8FL2C6 mini PC can be supplied with 8th generation Intel® Core™ i7/i5/i3/Celeron®-u processors. The system supports up to 32 GB of RAM, has two Gigabit network cards, Wi-Fi, and Bluetooth modules, and supports up to 3 video outputs (HDMI AND DP as standard and LVDS/eDP connector on the motherboard, which can also be used on demand). An M.2 SSD of size 2280 can be used as a storage device. Optionally available with a PCIe x8 slot. This mini PC has a wide range of I/O ports. There are four USB 3.1 ports. For industrial applications, the motherboard has RS232 (up to 4 ports) and RS485 (up to 2 ports) connectors, a universal GPIO connector and two SPI (Serial Peripheral Interface) connectors. It can also operate in the temperature range from -20° C to +60° C, withstand storage temperatures from -40° C to +75° C, and withstand serious shock and vibration loads.

►► 61669 at www.ien.eu

700W POWER SUPPLY

Optimized for conduction cooling applications



Powerbox has announced the release of a new 700W power supply for industrial applications named the OFI700A. The power supply operates with a wide universal input range from 85 to 264VAC with power factor correction (PFC). It is available

with DC outputs of 12V, 28V (adjustable to 24V) or 48VDC. A 12V auxiliary is also provided. In many industrial applications cooling of the dissipating elements relies on the use of fans and blowers. But there are applications where it is not possible or even allowed to use active ventilation. Conduction cooling requires very specific building practices and the PRBX OFI700A has been designed to guarantee optimal heat transfer from the dissipating components to the baseplate, delivering a high level of performances within an operating temperature of -40 to +95 °C at baseplate. Depending on the assembly method and the overall cooling conditions, a derating may apply as specified in the technical documentation. The unit includes a PFC with a coefficient of 0.95/0.92 (110VAC/230VAC). For applications powered by a DC bus e.g., mining equipment, the OFI700A operates from 120 to 350VDC. The output voltage can be adjusted using the provided onboard potentiometer. For example, the 28V output can be adjusted from 22.4V to 33.6V, covering the 24V applications. An additional voltage of 12V/0.1A is provided for auxiliary functions.

▶▶ 61554 at www.ien.eu

127 MEGAPIXELS CMOS CAMERA

The "fat boy" in machine vision



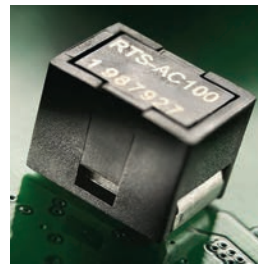
In order to classify even the smallest object structures in the highest quality, the demands on industrial cameras in terms of resolution and image quality have been growing steadily for years. However, the high-resolution sensors available on the market all have only a rolling shutter, which is easier to manufacture. The new shr661 CMOS camera from **SVS-Vistek** can therefore confidently be called a milestone in

machine vision, because it offers a huge resolution of 127 megapixels and still works with a global shutter. In the case of sensors with rolling shutters, the sensor lines are exposed and read out one after the other, which in applications with moving objects can lead to a time-delayed exposure of the sensor lines and thus to distortions and pattern artifacts caused by illumination. Global shutter sensors, on the other hand, expose all pixels simultaneously and then read them out. The advantage here is described easily: Moving objects are sharply imaged by the global shutter. For example, moving objects on an assembly line can be inspected down to the smallest detail even at this high resolution. SVS-Vistek's shr661 is based on the Sony IMX661 precious sensor with a pixel size of 3.45 µm edge length. It can reproduce even the finest structures of moving objects and represents the current high-end of industrial cameras in terms of image quality.

▶▶ 61555 at www.ien.eu

RTS THERMAL FUSE

Protects power semiconductors from thermal runaway



Launched in 2018, **Schurter's** Reflowable Thermal Switch (RTS) thermal fuse gets a new variant with a tripping temperature of >175°C. The RTS is a particularly compact overtemperature protection device for power semiconductors in SMD technology for highest demands.

RTS was developed to protect highly integrated power semiconductors from overheating. Prior to mechanical activation, the new thermal fuse can be soldered on conventional reflow soldering machines with profiles up to 260 °C. Thermal runaway refers to the overheating of a power semiconductor due to a self-reinforcing, heat-producing process. One of the reasons is the trend towards increasing power density and miniaturization of electronic circuits. The RTS protects these power semiconductors against thermal runaway. In such an event, the thermal fuse acts as a fail-safe device and reliably interrupts the circuit from as early as 175 °C and thus addresses the operating temperatures of common power semiconductors even better. The new overtemperature protection device comes in the same minimal dimensions and maximum breaking capacity despite its additional shunt functionality. On its small 6.6 x 8.8 mm footprint the RTS can handle operating currents of up to 130 A and rated voltages of up to 60 VDC.

▶▶ 61499 at www.ien.eu

REAL-TIME ENERGY MANAGEMENT

The VPVision software has been enhanced with release 7



VPInstruments introduced release 7 of the VPVision energy management system. VPVision is a complete real-time energy monitoring solution for all utilities within the company. As real-time energy monitoring is key to energy savings, VPVision

stands as a guiding hand to target energy savings and to improve the factory performance. In the release 7, the software appears more intuitive and self-explanatory, making a user manual almost redundant. Release 7 features many upgrades, including: Saving time by remote access. VPVision is now cloud enabled. So, prevent costly on-site visits and perform remote audits and system checks. Furthermore, updating is just a matter of minutes, as updates can be done automatically over the air; Quick navigation with linked widgets. No need to build complex dashboard and prevent a dataoverload. With the new linked widgets functionality, you can keep dashboard clean and simple for daily use, whereby more details can be accessed via the widgets; The right dashboard for the right job. Each factory, and each compressed air system is different. VPVision's improved page builder makes it even easier to create custom pages with the right KPI's / graphs / overviews / alarms and more. This combined with user profiles, ensures you can build the right dashboards for the right job.

▶▶ 61553 at www.ien.eu



EDGE AI SYSTEMS

Powered by the NVIDIA Jetson Family



Advantech Co., Ltd. launched the AIR-020 series, an ultra-compact series of edge AI systems powered by the NVIDIA Jetson family. Featuring a small footprint of just 139 x 110 x 44.5 mm (5.47" x 4.33" x 1.75") dimensions, AIR-020 series deliver low power computing with powerful AI inferencing capabilities utilizing NVIDIA Jetson Nano, TX2 NX, and Xavier NX SoM. AIR-020 series is a perfect fit for edge AI applications such as traffic monitoring, defect inspection, AGV/AMR, people counting, medical imaging and more. AIR-020X is powered by the NVIDIA Xavier NX SoM, while AIR-020T is powered by Jetson TX2 NX, and the AIR-020N is powered by Jetson Nano to meet diverse AI application. The three offerings deliver an ultra-compact design with just 139 x 110 x 44.5 mm (5.47" x 4.33" x 1.75") dimensions, making them easy to integrate into the applications.

▶▶ 61506 at www.ien.eu

FAST SURFACE CHECK SENSORS

For mobile paint and coating thickness measurements



Designed for high precision measurements of CFRP materials, the FSC1/7, the FSC1000 (Fast Surface Check) and the ISC1000 (Industrial Surface Check) from **Micro-Epsilon** determine the thickness of paints and

layers with high accuracy and on a non-contact basis. This is made possible by the innovative microwave technology with which these hand-held devices are equipped. The FSC1/7, the FSC1000 and the ISC1000 hand-held devices are used for precise paint and coating thickness measurements on CFRP materials. These determine precise results even on curved surfaces. The FSC models are approved as thickness gauges for the aviation industry, while well-known aircraft manufacturers, airlines and paint shops already use them for micrometer-precise measurements.

▶▶ 61537 at www.ien.eu

OPEN MATERIAL OPTIONS FOR 3D PRINTING

Open tier of third-party materials for FDM® 3D printers



Stratasys Ltd. announced the advancement of its manufacturing strategy with a new open tier of third-party materials for FDM® 3D printers via an annual Open Material License. Users will gain flexibility to explore broader sets

of materials that can accelerate additive manufacturing adoption. The company is already providing open material availability on Neo stereolithography 3D printers, as well as the recently announced Stratasys Origin® One and Stratasys H350™ 3D printers. By extending this materials ecosystem approach to FDM technology, the goal is to enable manufacturing customers to address new applications with demanding requirements while also having dual sources for materials.

▶▶ 61493 at www.ien.eu



FREE DIGITAL SUBSCRIPTION

AMD-BASED MOTHERBOARD

Equipped with matching chassis



Kontron is expanding its portfolio of industrial motherboards with the D3714-V/R mSTX. The new product in the space-saving mini-STX format supports up to four independent displays in 4K resolution. This

makes it suitable for applications such as digital signage, kiosks, medical displays, thin clients and ultra-small industrial PCs. A matching SMARTCASE™ for universal use is available for the two D3714-R versions in the form of the S511 housing kit. The new motherboard is based on the AMD Ryzen™ Embedded V1000 and R1000 platform including AMD Vega™ graphics and covers many application scenarios with a single system design. It is equipped with up to three DisplayPorts (V1.4, including DP++ support) and one HDMI port (V2.0b). It also offers dual channel LVDS (24bit), an embedded DisplayPort V1.3 (4K), 8 bit GPIO & HD audio onboard.

▶▶ 61507 at www.ien.eu

END-TO-END 3D PRINTING SOLUTION

To streamline and optimize 3D model production



Mimaki Europe offers a complete 3D printing solution designed to streamline and optimize 3D model production with increased automation. As a result, these new technologies aim to further accelerate the adoption of

high-quality, full-colour 3D printing. The new end-to-end solution features the Mimaki 3D Print prep Pro cloud-based software service, compatible with all Mimaki 3DUJ-series printers. Designed to simplify the 3D printing process, the new platform helps user prepare and finalise their 3D files before printing. This subscription-based software autocorrects file errors and optimises 3D data used in 3D printer modelling, ensuring that the final 3D printed objects look exactly the same as the ones visualised on the screen.

▶▶ 61407 at www.ien.eu

NEXT-GENERATION SOUNDING SYSTEM

For advance meteorological upper air observations



Vaisala launched the Cirrus Sounding System MW51 that provides industry-first capabilities, including readiness to conduct simultaneous upper air observations, to provide unprecedented

visibility into rapidly changing weather conditions and enhance forecasting accuracy. The proprietary radio technology enables superior operational performance and dependability over a long life cycle. The new compact design is purpose built for operating in versatile environments while an IP54 rating provides excellent protection against dust and water, for greater portability. The usability is enhanced through an intuitive and easy to use device with access to real-time sounding status information and comprehensive diagnostics. Last, it has robust data security: it provides protection against data threats and unauthorized access.

▶▶ 61405 at www.ien.eu

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