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2/2020

smart production solutions

www.konstruktion-entwicklung.de

mesago
Messe Frankfurt Group

Greeting from the organiser

Vice President SPS Sylke Schulz-Metzner from trade fair organiser Mesago on the new SPS Connect. | **06**

Digital meeting point

"We pursue a 365-day approach," says Vice President Sylke Schulz-Metzner. The fact that this year's SPS is taking place purely virtually as SPS Connect also offers opportunities. | **08**

The new standard is called Digital!

On 72 pages companies present news and innovations - Let yourself be inspired! | **16**

sps connect

The digital automation hub

AUTOMATION GOES DIGITAL

schlütersche

SENDING OUT THE RIGHT SIGNAL!

The fact that the SPS 2020 will be a purely virtual trade fair should have reassured exhibitors and potential visitors. This was the right signal from the trade fair organiser Mesago when the ‘real’ SPS in Nuremberg had to be cancelled and the virtual SPS Connect was announced. The virtual SPS Connect will also be taking place from 24-26 November, but you will still be able to virtually access any presentations etc. that you may have missed afterwards. What can exhibitors and visitors expect at SPS Connect? We are shedding some light on the matter in this issue of SPS Kompakt and would like to take this opportunity to wish you a good SPS Connect 2020!

Erik Schäfer, Editor-in-Chief KONSTRUKTION & ENTWICKLUNG

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smart production solutions

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Foto: SEW-Eurodrive

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2020

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Foto: Siemens

SOFTWARE & IT IN MANUFACTURING

MECHANICAL INFRASTRUCTURE

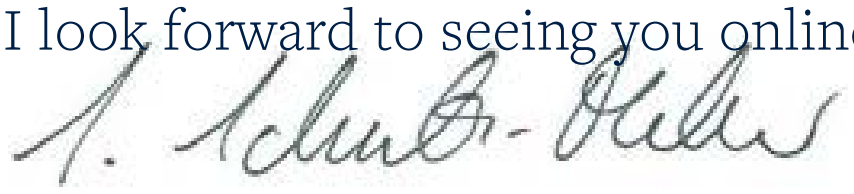
INDUSTRIAL COMMUNICATION

DEAR READER,

Who would have thought in the spring that the Corona pandemic would still be having such a strong grip on us at the end of the year and that the SPS would not be taking place in Nuremberg? What was unimaginable at the time has now caught up with us. We spent many months putting our heart and soul into making preparations for a safe and successful SPS 2020 in Nuremberg. In the end, though, we are convinced that cancelling the analogue trade fair was the right decision. Nevertheless, we are aware of the strong need, especially now, to exchange ideas and information, cultivate contacts and tackle challenges together. This is exactly what we want to offer with SPS Connect and we have therefore focused on networking, lead generation and matchmaking. The programme will be supplemented by roundtable discussions, specialist presentations and keynote speeches by and with experts from the industry.

This issue of SPS Kompakt will give you a foretaste of what to expect at SPS Connect and which innovations and further developments the exhibitors will be presenting there.

I look forward to seeing you online!



Your Sylke Schulz-Metzner, Vice President SPS

ASi-5

AUTOMATION REINVENTED.

YOUR PATH INTO THE DIGITAL FUTURE.

IO-Link

Bihl + Wiedemann

www.bihl-wiedemann.com

We are pursuing a 365-day approach

Erik Schäfer

THE ORGANISER OF THE SPS, MESAGO, ANNOUNCED AT THE END OF AUGUST THAT THIS YEAR'S EVENT WOULD BE COMPLETELY VIRTUAL (AND CALLED SPS CONNECT). WHAT WILL THE VIRTUAL SPS LOOK LIKE? TO ANSWER THIS QUESTION, WE SPOKE TO SYLKE SCHULZ-METZNER, VICE PRESIDENT SPS.

Ms Schulz-Metzner, the SPS is now also going to take place virtually – as SPS Connect. What are the key data here and what is the virtual version of the SPS going to look like?

Sylke Schulz-Metzner:

SPS Connect will take place from 24-26.11.2020. We've put together a high-quality programme for the virtual event that's just as good as it would've been if the fair had been held physically. The spectrum ranges from matchmaking and keynotes on current trends to lectures on leading industry topics. The digital platform offers participants a wide range of opportunities to meet suitable contacts and find the right products and solutions for their company.

There must have been strong demand for information about the virtual variant since the real SPS in Nuremberg was cancelled at the end of August. How can one still register for the event and what does SPS Connect offer exhibitors?

Sylke Schulz-Metzner:

Exhibitors and visitors will still be able to register even on those days when the event is taking place, which is the benefit of a virtual event. There's no need to build an exhibition stand or the like and you can join in at any time. However, we recommend that all participants register as early as possible. Exhibitors can then already fill in their profile and network with other registered participants at an early stage. That's another benefit: it's possible to start networking even before 24.11.2020. Specifying different contact persons allows visitors to find the right contact for a specific product or topic and then network. It's not possible to try out the products if the event is only virtual, but participating companies can give interested parties a first impression of their innovations with demo films or live broadcasts and answer specific questions about them. Furthermore, exhibitors can hold digital meetings to delve deeper into individual topics with their clients.

Mesago had already considered the need to develop a 'virtual SPS' at a very early stage. How did you organise it?

Sylke Schulz-Metzner:

The preparations for a trade fair like SPS take place over the whole year. During this period, discussions with the various stakeholders are held repeatedly to ensure that the event is optimally geared to the needs of our target groups. We've raised the bar continuously over the last 30 years.
When corona became an acute issue in the spring, we'd initially hoped that the situation would've normalised by November. However, it quickly became clear that this wouldn't be the case. We could have adopted a hybrid format the fair, with a trade fair at the Nuremberg location and expanded it digitally. However, the SPS community had increasing concerns and

worries due to the rising number of infections, so in the end the only option was to cancel the physical fair.
It soon became clear to us that the virtual expansion would become the main player this year because of the reduced need for a professional exchange. The programme that we've now put in place was developed in close consultation with industry experts. The driving aim was to provide the automation industry with a platform for exchanging ideas and networking in this exceptional year as well, even though implementing this project within the shortest possible time would be a challenge.

That raises countless questions. Did you involve the exhibitors in this, like asking them: What do you need? How can we offer you a platform?

Sylke Schulz-Metzner:

The members of our exhibitor advisory board actively support us year after year and their input is immensely important to us. This year, they've also advised us on the virtual event, as some of the exhibitors have already taken part in several digital events this year or have held one themselves. One important piece of information was that sales staff in particular couldn't keep in touch with their clients in the usual way due to the travel restrictions and contact bans. That's why the online platform used for the SPS deliberately focuses on networking, exchange and lead generation, with an AI-based algorithm for bringing suitable contacts together.

There's now a huge range of agencies with 3D artists, camera operators and IT specialists who 'stage' virtual events. How did you find the right partner?

Sylke Schulz-Metzner:

That really was a long search! We also looked at and tried out different platforms, of course. However, it was clear to us from the very beginning that the main focus of our event should be on making contacts and exchanging ideas between the participants. That's why we chose a partner with a lot of expertise in that area.

Stefan Rief, head of the Organizational Development and Work Design Research Department at the Fraunhofer Institute in Stuttgart predicted in the Schaeffler publication 'tomorrow' (1/2020): "Both the range and quality of free virtual seminars and conferences will increase massively." Will visitors to the virtual SPS Connect have to pay to enter?

Sylke Schulz-Metzner:

A regular ticket for SPS Connect costs 25 euros, but all the exhibitors at SPS Connect can invite their clients free of charge.

All over the world, physical events have been postponed or cancelled completely due to the Corona pandemic. Regarding the SPS, what does the future look like in this area? Will the virtual variant be continued, even when physical events become possible again?

Sylke Schulz-Metzner:

In numerous discussions with the SPS community, we decided some time ago to pursue a 365-day approach. However, this doesn't mean that we want to replace the physical trade fair with another format. We're still convinced that the creative exchange within the community, which is so valuable, takes place primarily in person. What we would much rather like to do is make an offer available all year round as a digital supplement to the fair. Further information on this will be available in the next issue at the latest.

Thank you very much, Ms Schulz-Metzner. I'd like to wish you, your team and all the exhibitors and visitors a successful SPS Connect and we look forward to the time when it'll be possible to hold physical events again.

Web-Guide:
www.sps.mesago.com

sps connect

The digital automation hub

The supporting programme for SPS Connect

AT SPS CONNECT, YOU CAN EXPECT A SUPPORTING PROGRAMME COVERING A BROAD RANGE OF ISSUES OVER JUST THREE DAYS. FIND OUT MORE ABOUT THE PRESENTATIONS AND THEIR THEMES HERE.

THE FOCAL THEMES ON THE THREE DAYS OF THE EVENT

Tuesday, 24.11.2020
10:00-17:00
Impact of the corona pandemic and the digital transformation
Industry 4.0 | Digital twin

Wednesday, 25.11.2020
10:00-17:00
Artificial intelligence and intelligent operating concepts
Sensors and industrial communication

Thursday, 26.11.2020
10:00-17:00
Cyber security and IT in manufacturing
Robotics, motion, functional safety and DC infrastructure

THIS WAY TO THE TICKET SHOP: »KLICK«

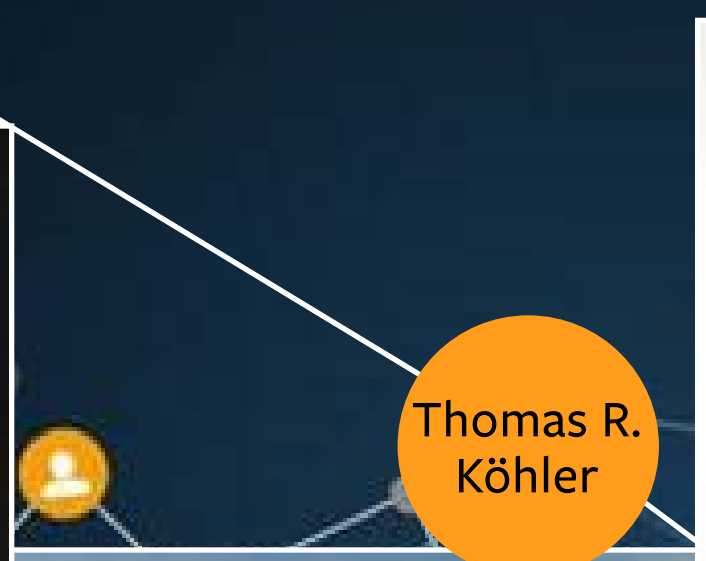
VIDEO:
This is how the SPS Connect works:

Day	Time	Stage	Type of P
Tuesday, 24.11.2020	10:20 – 10:40	Mainstage	Keynote
	11:25 – 11:55	Mainstage	Keynote/ Technical I
Wednesday, 25.11.2020	10:15 – 10:55	Mainstage	Keynote
Thursday, 26.11.2020	10:15 – 10:55	Mainstage	Keynote
	12:00 – 12:20	Mainstage	Technical I
	14:00 – 14:20	Mainstage	Technical I
	11:30 – 11:50	Mainstage	Technical I

Dr. Gunther Kegel

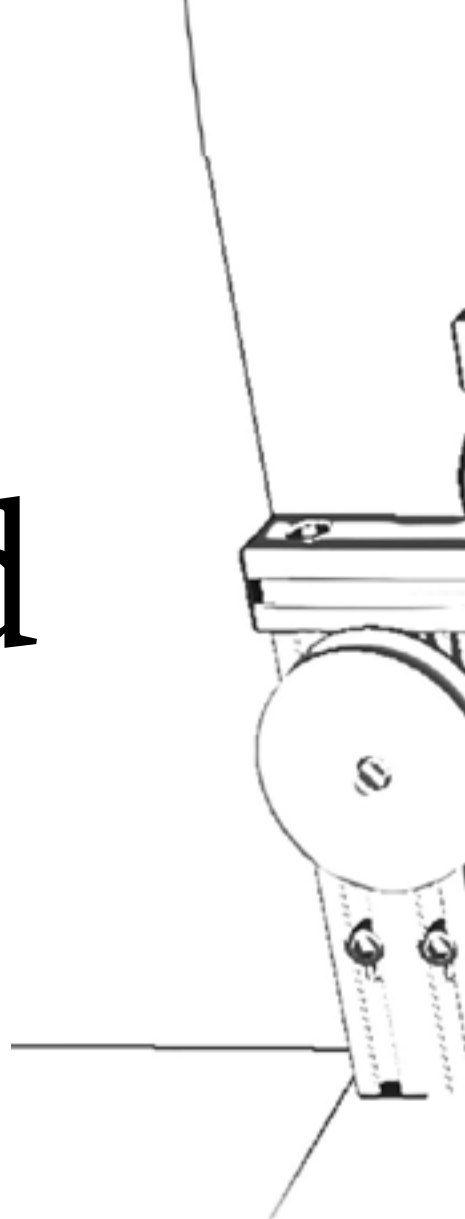
Karl-Heinz Land

resentation	Title	Speaker
	Corona – catalyst for digitisation?	Dr. Gunther Kegel (Pepperl+Fuchs (ZVEI)
lecture	Standstill as an accelerator	Karl-Heinz Land
	Artificial intelligence	Dr. Holger Schmidt
	Cyber security for industrial plants / IIoT	Thomas R. Köhler
lecture	Digitisation for SMEs – what's possible	Angelo Bindi (MES D.A.C.H Verband)
lecture	Safety – 'degraded operation'	Rolf Schumacher, SICK AG (ZVEI)
lecture	Cyber security	Markus Wöhl, Videc



Virtual showcase for industry-related research

Mihai Dragan



THE ISW IS ONE OF THE LEADING RESEARCH INSTITUTES IN THE FIELD OF CONTROL ENGINEERING. FROM PLANNING TO THE TOOL – AN INNOVATIVE PARTNER FOR THE INDUSTRY

We drive digital production forward with technologies that are currently gaining momentum in manufacturing – blockchain, real-time capability or innovative, interdisciplinary automation solutions for production optimization. Our contribution to future manufacturing is on display yearly at the SPS and now also online at SPS Connect or on YouTube.

SHOP FLOOR TRANSFORMATION

The digital transformation is in full swing in medium-sized manufacturing companies. The KOSMoS project team recognizes a trend moving away from single process optimization towards a solution for the entire value network. Every company depends on partners, customers and suppliers. A goal-oriented collaboration therefore makes the difference between success and stagnation and blockchain is ideally suited for implementing these goals.

We also developed the Shop Floor Service Connector SFSC as a message-based middleware with focus on simplicity for service-oriented applications on the SME shop floor. Advantages of cloud computing software stacks are thus tailored to requirements of shop floor software services.

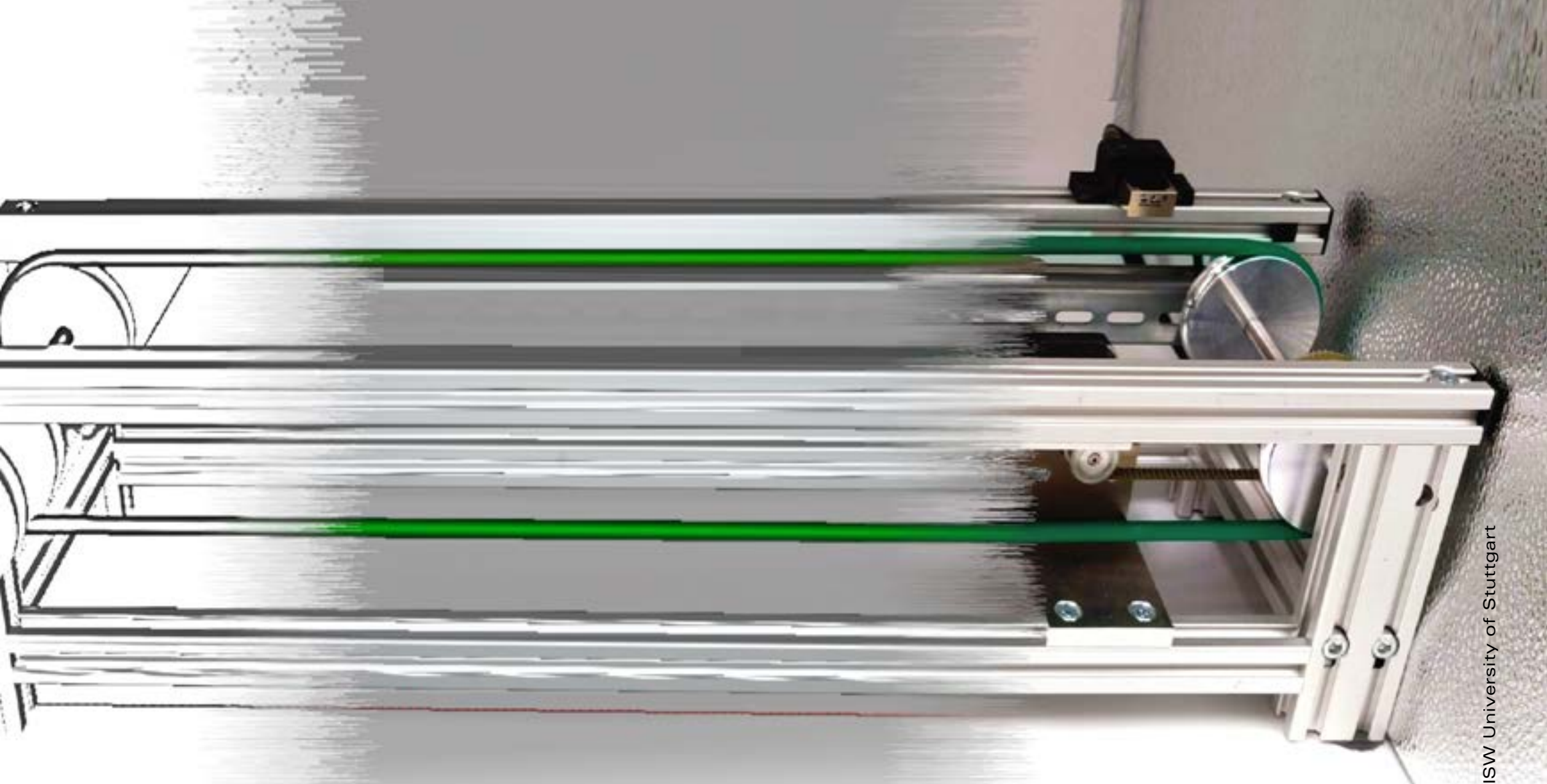


Photo: © ISW University of Stuttgart

Transition between model-, software- and hardware-in-the-loop test configurations (CoSBE).

In the project TSN4KMU we develop mechanisms for the integration of TSN into existing machines and factories with a seamless integration of field devices. This allows a step-by-step migration towards converged networks with all benefits.

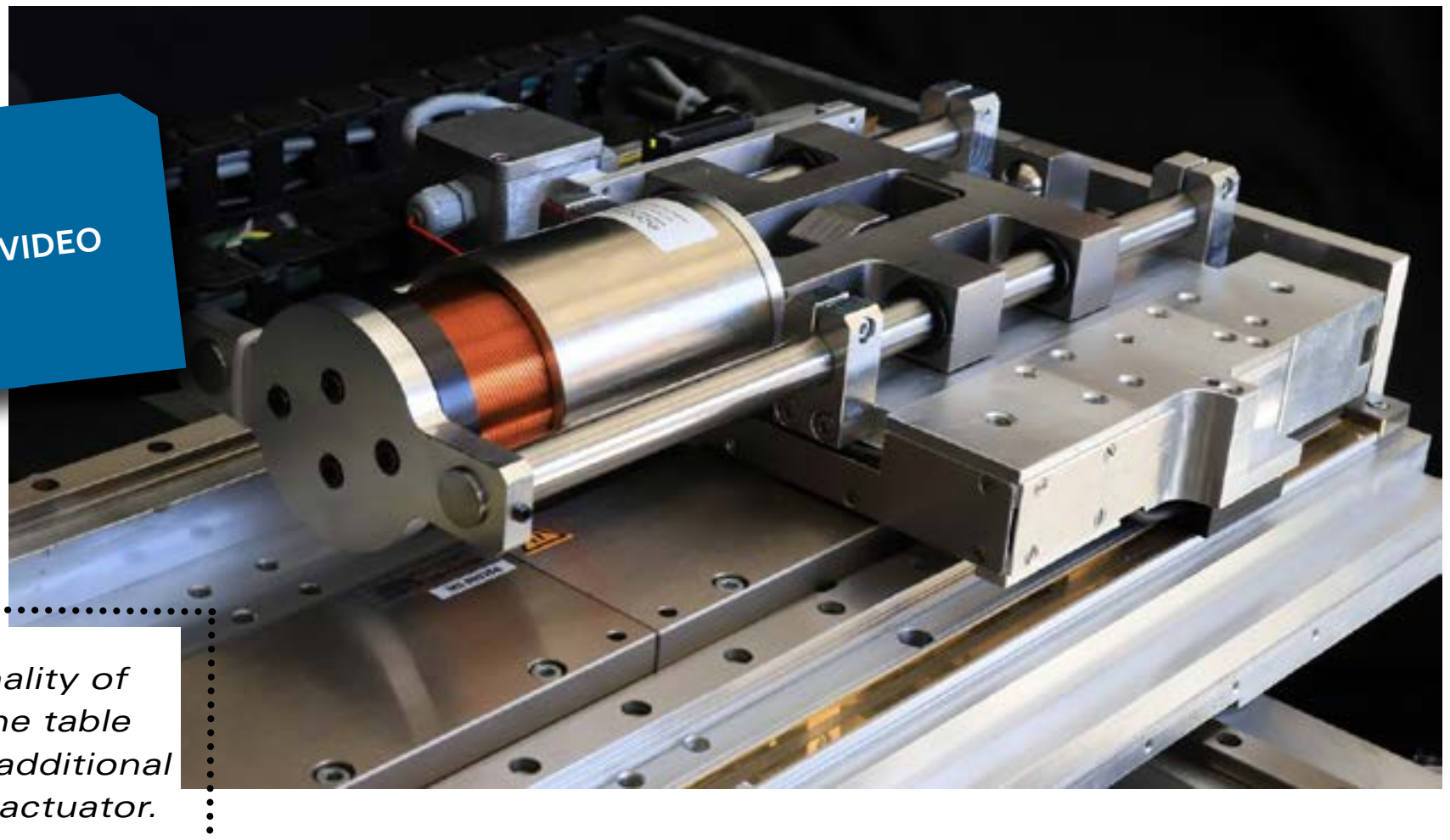
VIRTUAL COMMISSIONING

The phases of virtual commissioning are ideally run within a single simulation model. Our concept shows how collected information from test phase transitions can be handed over without data loss. CoSBE also allows running models operating in different test configurations in parallel.

The piece-good-based material flow can be modeled in different ways for virtual commissioning: physics-based (high detail accuracy) or as a density distribution (large quantities). The combination of both models as a Two-Scale Material Flow Model allows a situation-based observation in the simulation.

INNOVATIVE AUTOMATION

Gravity casting involves pouring molten metal into moulds. We developed an industrial NC adapted for



VIDEO

Functionality of a machine table with an additional impulse actuator.

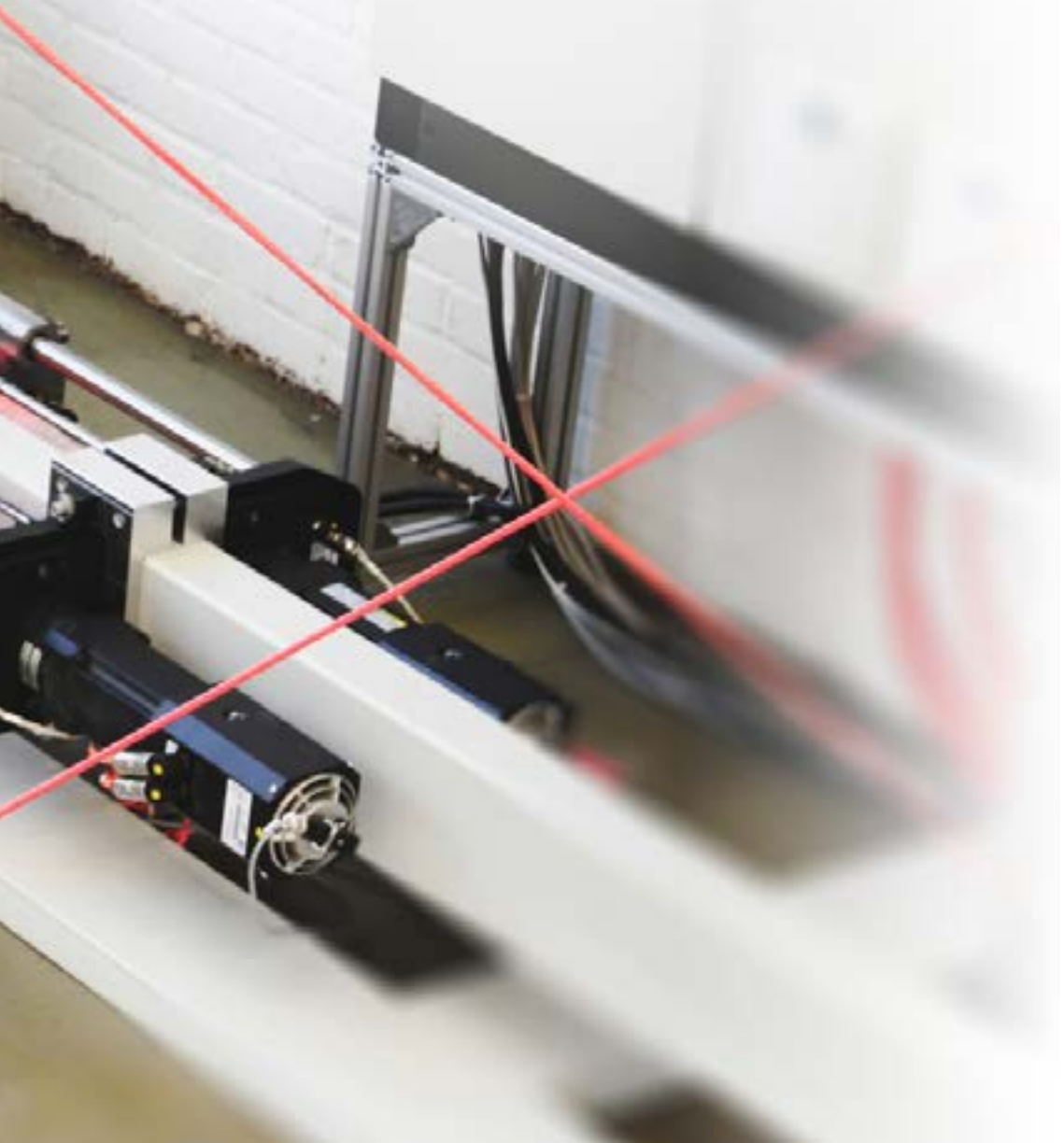
automated gravity casting. It can control the effective flow rate of liquid metal based on process equations. Integrating process knowledge into an NC allows easier process programming and also increases process reliability and quality.

Cable robot platform connected via red cables to the winch system.

The dynamic of feed axes is mostly limited by the available motor torque of the drives and the structural rigidity of the machine. Our research showed that these restrictions can be overcome by attaching another actuator to the machine table. Transmitting pulses by mechanical impacts leads to abrupt changes in feed velocity, while the excitation of the machine frame is greatly reduced.

We are also developing industrial applications for cable robots – parallel robots that use cables instead of prismatic joints to move a platform. Positioning and orientation are achieved by a coordinated adjustment of cable lengths. The platform can reach high speeds and accelerations, allowing for various use cases.

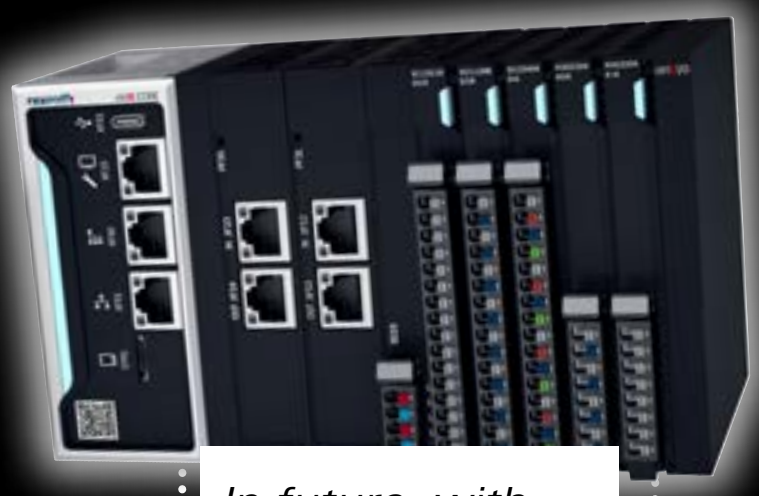
Web-Guide:
www.isw.uni-stuttgart.de/en/



Automation is software development

Steffen Winkler

WHEN WE LAUNCHED THE CTRLX AUTOMATION PLATFORM AT THE END OF 2019, WE STARTED WITH THE ASSUMPTION: TODAY, MECHANICAL ENGINEERING IS SOFTWARE DEVELOPMENT. WE ARE NOW GOING A STEP FURTHER AND SAYING: AUTOMATION IS SOFTWARE DEVELOPMENT. WHY?



In future, with the new ctrlX I/O portfolio the Rexroth automation platform will be even better networked and geared towards future technologies.

With ctrlX Automation we focused on classic machine and factory automation in the first phase of the market launch. We will continue to do so. However, the strong positive feedback we received from the market has shown us that ctrlX Automation also solves user problems in numerous other industries. These include, for example, building automation, intralogistics and goods logistics, power generation and distribution and, increasingly, mobile automation applications.

The platform offers almost unlimited application possibilities with its maximally open software architecture, complete hardware portfolio and integrated IoT, security and safety functions. Currently there are more than 200 customers worldwide who are already implementing ctrlX Automation.

Since it was introduced, we have continuously developed the solution further, for example by adding various services such as the ctrlX App Store and the ctrlX Automation Community, the completely new I/O program ctrlX I/O and the ctrlX SAFETY line, which is a new range of small safety controllers for general automation.

The openness of ctrlX Automation has already been proven by the first partners of our ctrlX World who are complementing the platform with software and/or hardware, integrating parts of ctrlX Automation into their own systems or providing software services for users. They include suppliers like Schunk, Wittenstein and Forcam.

Web-Guide:
www.ctrlx-automation.com
Visit us at the SPS Connect

»Bosch Rexroth will be exhibiting on the SPS connect virtual platform.«

Steffen Winkler

Steffen Winkler, Vice President Sales Business Unit Automation & Electrification Solutions, Bosch Rexroth AG

Photo:Bosch Rexroth AG

Dynamic, precise and compact

Dr. Rainer Kimmich, SEW-Eurodrive, Bruchsal

PORTAL SYSTEMS FOR HANDLING TASKS INCREASE EFFICIENCY IN MODERN PRODUCTION. HERE, THE CM3C SERVOMOTOR SERIES FROM SEW-EURODRIVE FACILITATES COMPREHENSIVE AUTOMATION.

This linear gantry robot was assembled from FLT's new modular axis and gantry system.

FFibro Läpple Technology GmbH (FLT) of Hassmersheim, Germany, is using several motor sizes, each with adapted torques, for its modular axis and gantry modular component system. For example, CM3C100L motors with 39.6 Nm continuous stall torque are used for the travel axis and an installation-space optimised CM3C80L with 22.8 Nm continuous stall torque for the lifting axis.

Photos: SEW-Eurodrive

View of the vertical-axis drive with CM3C motor and helical-bevel gear unit

HIGHLY FLEXIBLE MODULAR SERVO GEARMOTOR SYSTEM

The CM3C servomotor series from SEW-Eurodrive has a significantly higher mass moment of inertia due to the enlargement of the rotor diameter and thus offers control-related benefits in applications that are themselves characterised by high moments of inertia or large moving masses. This motor series is available in the sizes 63S to 100L and continuous stall torques from 2.7 Nm to 40 Nm.

In addition to the common resolvers and Hiperface encoders, the new, innovative Movilink DDI single-cable system is also used as a motor encoder. Not only does this result in considerable savings in cabling costs: it also offers a whole range of additional functions, in contrast to the solutions that have been available on the market until now. For example, the digital Movilink DDI protocol is not only used to transmit encoder information and motor temperature. It will also be possible in future to

CM3C servo gearmotors from SEW-Eurodrive

control the brake digitally and to monitor the condition of the drive via status information.
In addition to its own encoder systems, SEW-Eurodrive has also introduced a number of other encoder systems in the form of the CM3C. This means that motors can be equipped with Hiperface DSL, ENDAT2.2 or DriveCliq encoders as an alternative.

EASY COMMISSIONING

The Movilink DDI single-cable technology makes it easy to commission SEW servomotors. Once it has been connected using Movilink DDI, the motor logs on automatically to the Movi-C frequency inverters and the system takes over all the necessary configuration steps. Existing controller settings are retained.

Web-Guide:
www.sew-eurodrive.com

Visit us at SPS Connect

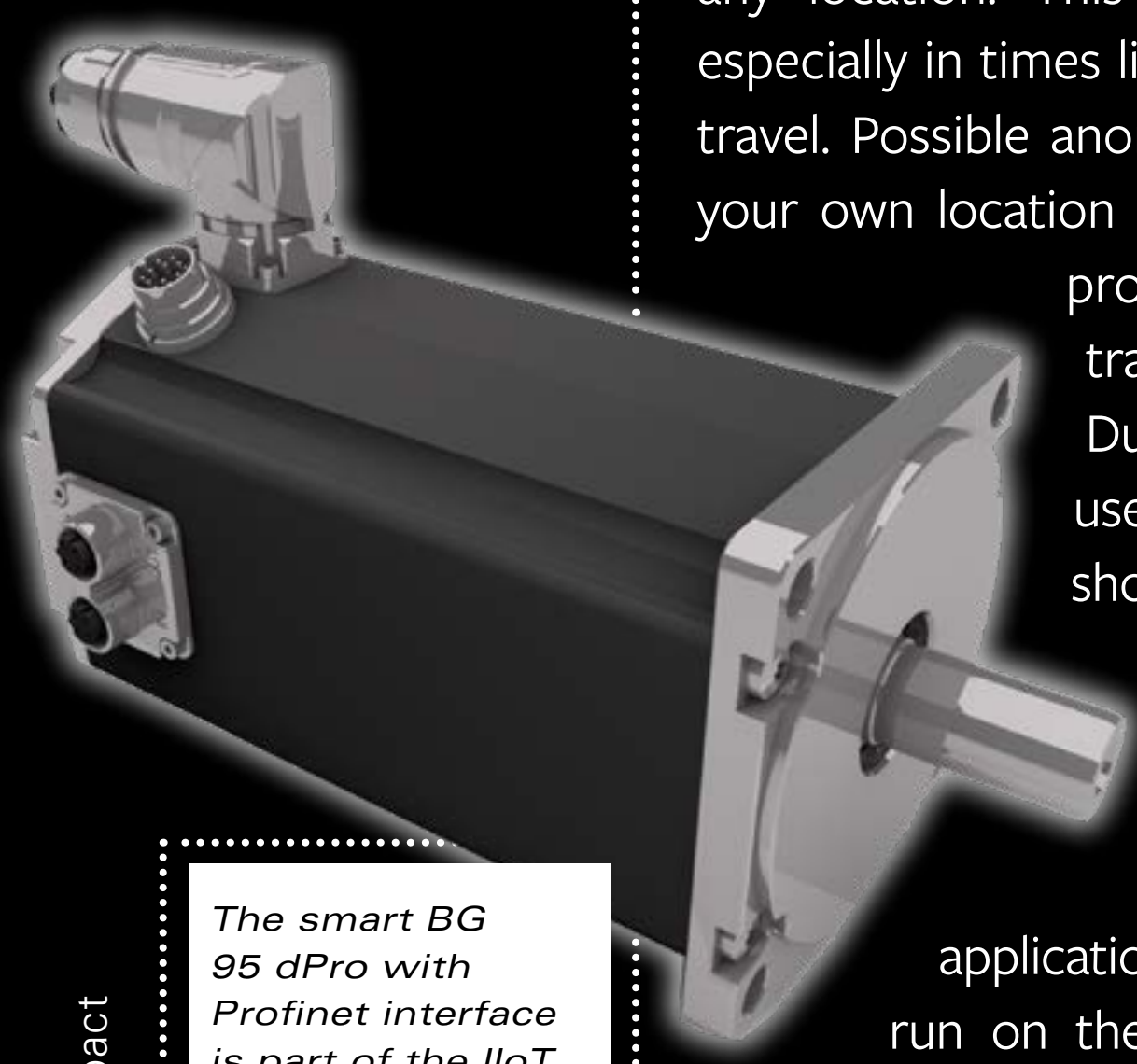
Photos: SEW Eurodrive

The new IIoT demonstrator

Markus Weishaar

DUNKERMOTOREN WAS ORIGINALLY PLANNING TO PRESENT ITS NEW IIOT DEMONSTRATOR FOR THE FIRST TIME AT THE SPS IN NUREMBERG. THE COMPANY WILL NOW BE PARTICIPATING IN SPS CONNECT AND IN ADDITION HAS SET UP A VIRTUAL EXHIBITION STAND ON ITS WEBSITE WHICH WILL ENABLE THE IIOT DEMONSTRATOR TO BE EXPERIENCED DIGITALLY.

Photos: Dunkermotoren



The smart BG 95 dPro with Profinet interface is part of the IIoT demonstrator.

The Internet of Things (IIoT) is constantly offering new possibilities for monitoring machines and equipment from any location. This is becoming increasingly important, especially in times like these with limited opportunities for travel. Possible anomalies can be diagnosed directly from your own location and the best possible support can be provided with the lowest possible costs for travel.

Dunkermotoren's IIoT team has taken the use case and built a demonstrator that shows how intelligent servomotors can be diagnosed quickly and easily via the cloud. A BG 95 dPro PN was connected to an EDGE gateway via Profinet for the demonstrator. Modular software applications developed by Dunkermotoren run on the gateway. One container records the general device information on the electronic type plate, while a second records live motor data such as the actual voltage, speed or temperature. In addition to the

modules for the connection to and provision of information on the EDGE, the demonstrator also contains modules for cloud connection. In a first step, cloud connectors to Microsoft Azure and Software AG's Cumulocity were implemented here. To complete the use case, dashboards for the motors were created on these two platforms, which provide an immediate overview of the state of the motor. The motor type, actual status and actual live data are displayed. Dunkermotoren adopts a variable approach depending on the needs of its clients. Besides ready-made motor dashboards, as in the example of the demonstrator, Dunkermotoren is planning to provide evaluated information on the status of the motors directly into its clients' applications. This means clients do not need to acquire expertise in the field of evaluating and analysing the state of motors. Dunkermotoren's declared aim is to provide its clients with the best possible support in their IIoT implementations.

The modular concept on the EDGE allows easy compilation of the required components, which are individually adaptable for each application. The implementation corresponds to the guidelines of the Open Industry 4.0 Alliance, which Dunkermotoren joined in 2019. The company is clearly pursuing the philosophy of an open and interoperable approach using existing standards.

Markus Weishaar, Product-manager IIoT at Dunkermotoren

Web-Guide:
www.dunkermotoren.com/en/

Components that talk

MAYR ANTRIEBSTECHNIK IS FOCUSSING ON BRAKE MONITORING.

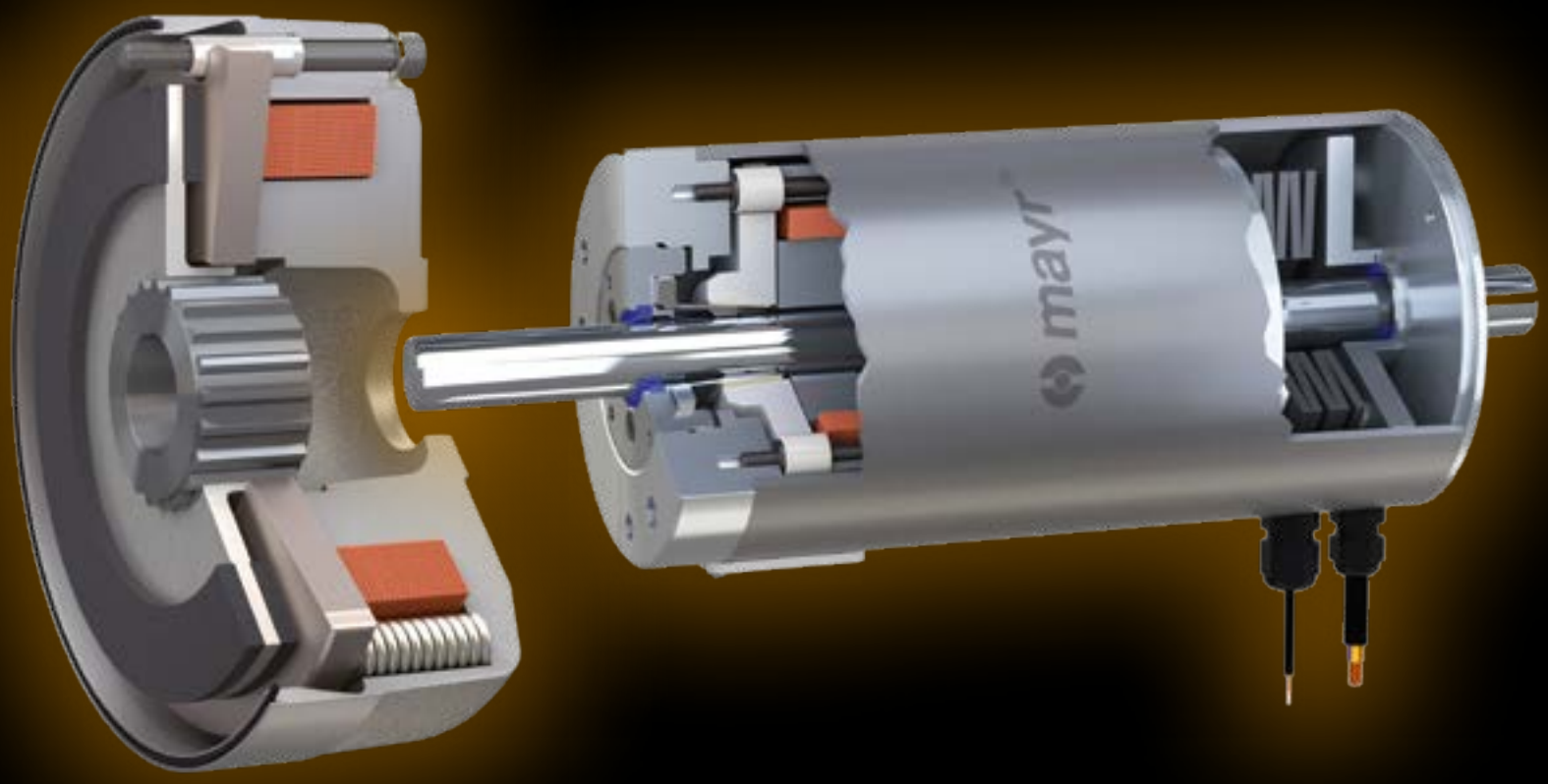
Photos: Mayr Antriebstechnik

“With the Roba-brake-checker module, we’ve developed a smart electrical component that enables our brakes to communicate without additional sensors.”
Andreas Merz, Productmanager

In an interview, Andreas Merz, Product Manager at Mayr Antriebstechnik explains how the Roba-brake-checker module ensures transparency in the drive train and supports efficient and predictive machine maintenance.

Brakes are mechanical components and they’re initially unable to speak. How do they learn to talk?
Andreas Merz: With the Roba-brake-checker module, we’ve developed a smart electrical component that enables our brakes to communicate without additional sensors. The retrofittable module is clamped into the power supply of the brake. By means of an extended analysis of current and voltage, it detects the movement of the armature disk and knows which state the brake is in. In addition to monitoring the switching status and critical coil temperature, the Roba-brake-checker also performs preventive function monitoring for wear, performance reserve and faults.

The module is intended to make safety visible. How?
Andreas Merz: In an extended version, the module is equipped with an additional board with a customer-specific interface (e.g. optical, WLAN, IO-Link, OPC UA, etc.). It can supply data on switching time, current, voltage, resistance, power and relative starting current via this interface. This also allows progressions to be evaluated, conspicuous features in the machining process can be quickly recognised and conclusions can be drawn from complex correlations. Safety and reliability become visible, as it were.



(left): *Roba-brake-checker: sensorless, networked brake monitoring for efficient and predictive machine maintenance*

(middle): *esides rotatory brakes like the Roba-stop-M safety brakes, the electromagnetic version of the well-proven Roba-linearstop linear brake series (***right):** *is also approved for monitoring with the Roba-brake-checker module. It is the only electromagnetic rod brake on the market.*

What benefits does that have for machines?

Andreas Merz: Our brakes are often installed at various points in the drive train, for example in machine tools. This allows information from different axes to be synchronised. All this data from malfunctioning and normal operation provides valuable input for future improvement and optimisation, for instance for more plant safety or an increased performance limit. In addition, the plant operator or manufacturer can carry out maintenance in a targeted manner and adapted to his working procedure.

Maintenance can thus be planned and is cost-effective thanks to the permanent inspection. Furthermore, it is also possible to integrate it into remote maintenance systems.

Web-Guide:
www.mayr.com

The digital future is now

DIGITAL TWIN: FASTER TIME-TO-MARKET USING PROSIMULATION SOFTWARE.

ProSimulation software simplifies the design, virtual optimisation and commissioning of machines and plants.

Simulation brings many benefits in electrical drive technology: reduced time-to-market, automated commissioning, increased drive efficiency, optimum design and simple analysis of existing processes. Baumüller uses various simulation tools to simulate drives and processes. It is important that the right simulation solution based on the appropriate simulation software is available for every problem and every application. Baumüller's own ProSimulation software is an optional function of the ProDrive software, which enables simple and fast commissioning, parameterisation and operation of the b maXX inverter family. ProSimulation simplifies the virtual design, optimisation and commissioning of machines and plants.

Experienced users can quickly set up their own simulations and application cases with the help of the basic libraries in Pro Simulation. Existing software models can be imported and further processed via open interfaces. The software thus paves the way to the world

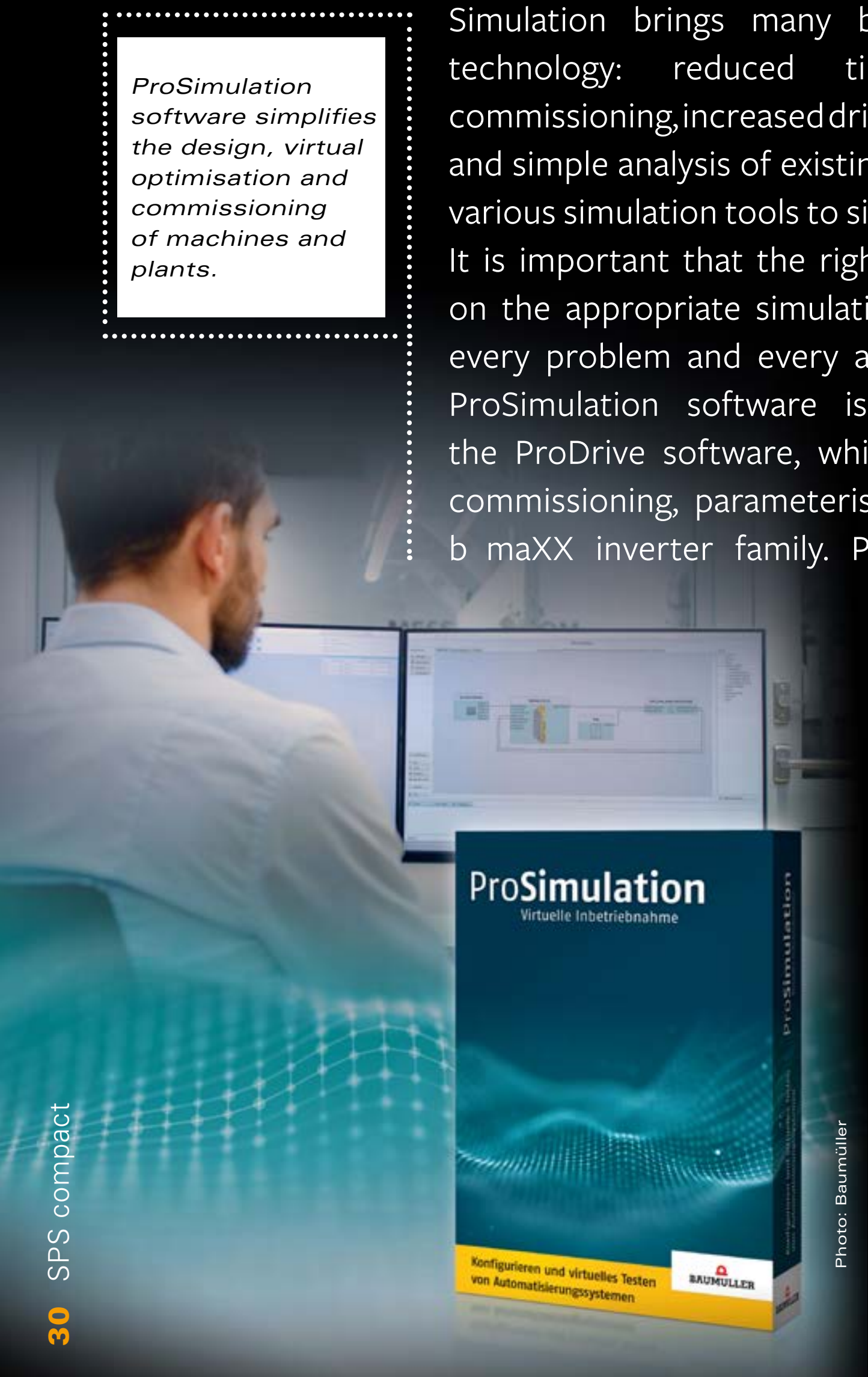


Photo: Baumüller

of simulation for small machine manufacturers. Pro-Simulation facilitates virtual parameterisation for optimising machine behaviour. This is a real added value for industry because innovations can be tested very quickly – even offline – thereby shortening time-to-market. This means tim e and cost savings when developing and commissioningmachinesandplants,aswellaswhenoptimising existing machines.

DEVELOP EXPERTISE IN SIMULATION

ProSimulation enables urgently needed expertise in simulation, and thus competence in the fields of Industry 4.0 and the use of a digital twin, to be built up in a company for future use. The tool is designed to be used by simulation professionals and beginners alike.

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Web-Guide:
www.baumueller.com/en/en/

Dual-loop control: good vibrations and gear back

Jürgen Wagenbach

IS IT POSSIBLE TO POSITION LOADS DYNAMICALLY, WITH HIGH PRECISION AND WITHOUT VIBRATION DESPITE MECHANICAL PLAY AND ELASTIC COMPONENTS? YES, IT IS – WITH AN INTELLIGENT SYSTEM APPROACH.

Electrically driven movement of loads is usually carried out using a system that determines the position and speed information for the control by means of an encoder on the motor shaft. A high resolution of the encoder and the precise detection of the motor shaft reaction are a prerequisite for dynamic position control.

From an application point of view, though, the precision of the outgoing load movement is ultimately the criterion that affects the quality and dimensional accuracy of the goods produced. Gears, spindles and drive belts can have a negative influence. Depending on the direction of movement, gear backlash can lead to a different load position on the output side, and elasticity can cause delays and vibrations when movement starts or stops. The first thought is to mount the encoder on the output shaft instead of on the motor shaft. This does not lead to success, however: the behaviour of the system becomes even worse. In the case of backlash or elasticity, it is necessary to adopt a system approach with control based on two encoder systems to achieve dynamic, precise load positioning:

- A so-called auxiliary encoder is connected rigidly to the motor shaft. This should already be part of the motor combination.
- On the output side, another encoder, the main encoder, is coupled to the moving load. Dual-loop control is then

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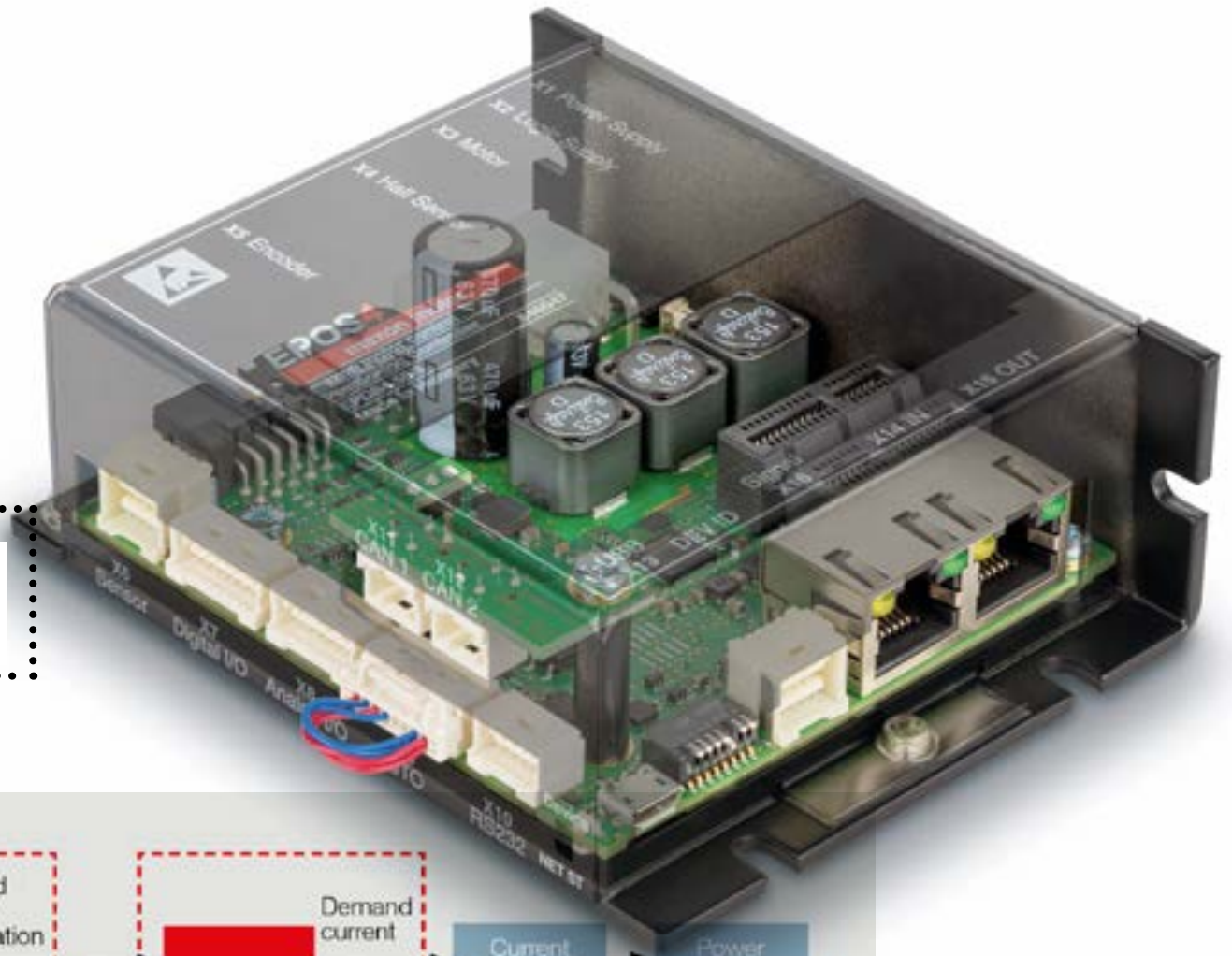
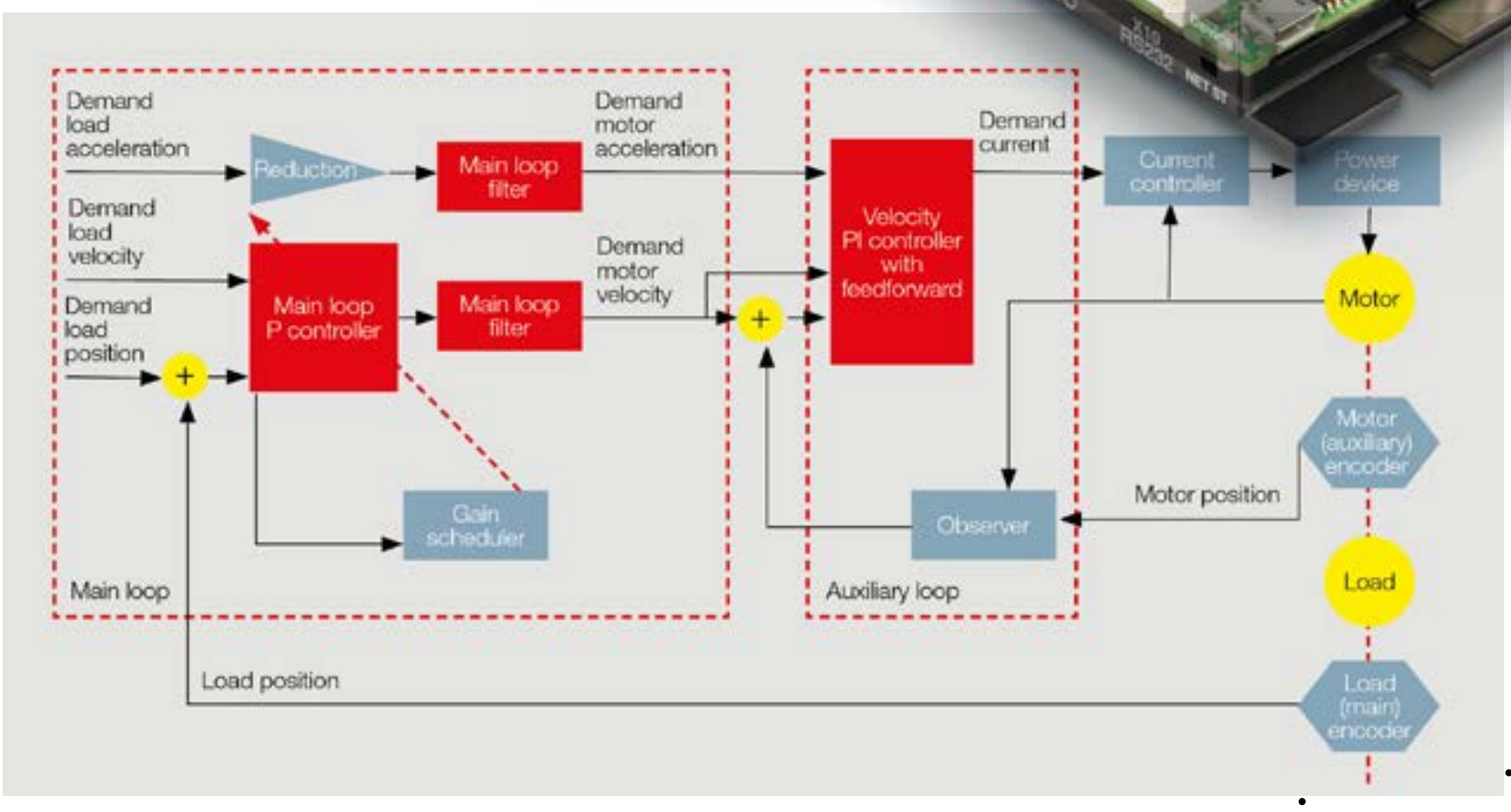


The EPOS4 50/5 positioning controller from Maxon



Photos: Maxon

A more detailed view of the Epos4 dual loop controller structure

required to process the signals from these two encoder systems. Epos4 positioning controllers from Maxon enhance such a dual-loop control with a second-order filter and a gain scheduler to counteract mechanical resonances and gear backlash. The Epos Studio commissioning software provides automatic determination of the parameters ('regulation tuning') of the complex controller structure and the recording of the transmission function of the drive. The Epos4 uses a cascaded controller structure for dual-loop control.

- The innermost control loop is field-oriented control (FOC) of the motor current based on the measurement of the motor current as the feedback signal.
- The second internal control loop, the auxiliary control, regulates the motor speed based on the encoder on the motor shaft. The outer control loop, which is the main

control, regulates the load position based on the load-side encoder system. The main control loop consists of a proportional (P) controller, a gain scheduler and a second order filter, the main loop filter. A path planner specifies the desired position of the load as well as its desired speed and desired acceleration as input variables for the main control loop. As a further input variable, the encoder measures the current actual position of the load.

Download

The gain scheduler is used in the Epos4 dual-loop control to eliminate negative effects caused by gear backlash. The gain scheduler automatically adjusts the P-gain of the main control loop. If the contouring error, in other words the deviation between the load-side setpoint and actual position, is large, a high P-gain is used, which leads to the error being reduced rapidly. If the contouring error becomes increasingly smaller, the P-gain is also reduced so that no oscillations occur in the drive despite gear backlash. If there is a certain amount of elasticity between the motor and load due to couplings, belts or long spindles, resonant frequencies could cause amplifying oscillations up to instability of the control. To avoid this, the EPOS4 dual-loop control uses a so-called second-order notch filter. This suppresses the resonance frequency range in the output signal of the main control loop and thus prevents harmonic oscillations in the drive train. The auxiliary control loop consists of a proportional-integral (PI) controller with feed forward (FF) and an observer that estimates the motor speed from the position information of the motor-side encoder and the measurement of the motor current.

To simplify commissioning, Maxon's Epos Studio software offers an integrated Autotuning Wizard to determine and check the parameters of the dual-loop control. The autotuning procedure consists of two fully automated 'experiments'.

- Experiment 1 sets the motor shaft in oscillation and this

»What makes a compact drive system?«

In the free webinar, Maxon explains why the engine isn't the only thing that matters.

is used to determine the moment of inertia, the torque constant and friction in the motor. The parameters for the auxiliary control loop and the observer are calculated based on the data determined.

- Experiment 2 is used to calculate the parameters for the main control loop including the notch filter. For this purpose, a pseudo-random binary sequence (PRBS) signal is used to excite the system being controlled. The transfer function is identified on the basis of the resulting input/output data and presented as a Bode plot. The Bode plot can be exported and helps control engineers to analyse the system in order to optimise the mechanical design or manually tune the control for specific applications.

Dual-loop control is a way of making drive systems more precise and efficient. Maxon offers not only all the components for this, but also a wealth of experience in consulting – from the idea via the concept through to series production.

Web-Guide:
www.maxongroup.com

Visit us at the SPS Connect

Enhanced power and
thanks to BLDC moto

BLDC MOTORS ARE IDEAL POWER PACKS WHEN IT COMES TO THE MOBILITY OF ROBOTS. SAWYER, THE INTELLIGENT ROBOT, PROVES THIS.

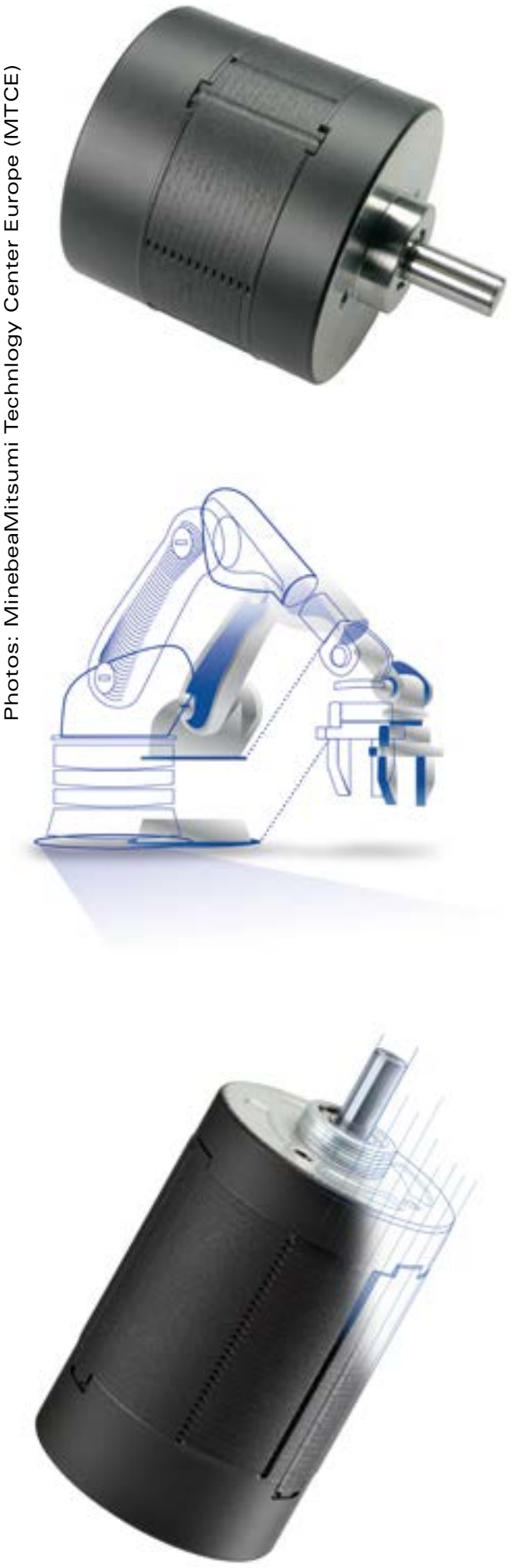
MinebeaMitsumi Technology Center Europe (MTCE) has developed the brushless DC motors (BLDC-motors) for Sawyer, a collaborative robot (cobot), which is setting standards in robotics and Industry 4.0. BLDC motors developed by MTCE include the artificial muscles of Sawyer, a cobot developed for industrial applications by the then US company Rethink Robotics, Inc. Since the takeover of the assets by the Hahn Group in October 2018, Hahn, operating as Rethink Robotics GmbH has been optimising Sawyer the cobot and the Intera software. Thanks to Intera, Sawyer does not require any complex programming.

Sawyer learns a new application simply by guiding his arm according to the movement to be performed. This means that the cobot is ready for a new activity in just a few minutes without any previous knowledge.
It is a revolutionary, self-learning, high-performance robot designed for use in machine assembly, PCB testing and other precision tasks that could not previously be easily automated with industrial robots. The robot is a breakthrough innovation designed for interactive, safe and cost-effective automation. The opportunities

service life
ors

A BLDC motor operates using electronic Hall sensors to commutate the stator coils.

that future autonomous robot systems have to offer can only be implemented if operation and active control are simplified considerably. However, even a simple rotary movement requires the movement of different joints, which means several motors in its body must simultaneously perform different, precise rotary movements. Instead of using wear-prone brushes, a BLDC motor operates using electronic Hall sensors to commutate the stator coils. The sensors, which are controlled by special software, are also used to detect the position. This is one of the focal points of today's drive developments – in software and electronics. The BLDC motor also offers significantly better electromagnetic compatibility. This means that sensors or electronics located in the vicinity are not affected by electromagnetic effects. Apart from a high level of running smoothness and a longer service life, the use of these motors in robots is ground-breaking. They are optimally designed for their task and save energy.



Photos: MinebeaMitsumi Technology Center Europe (MTCE)

Web-Guide:
www.minebeamitsumi.eu/en/

Ethernet technology for the smart factory

LAPP NOW HAS SEVERAL NEW DATA TRANSMISSION SYSTEMS IN ITS PORTFOLIO SPECIFICALLY FOR USE WITH ETHERNET TECHNOLOGY

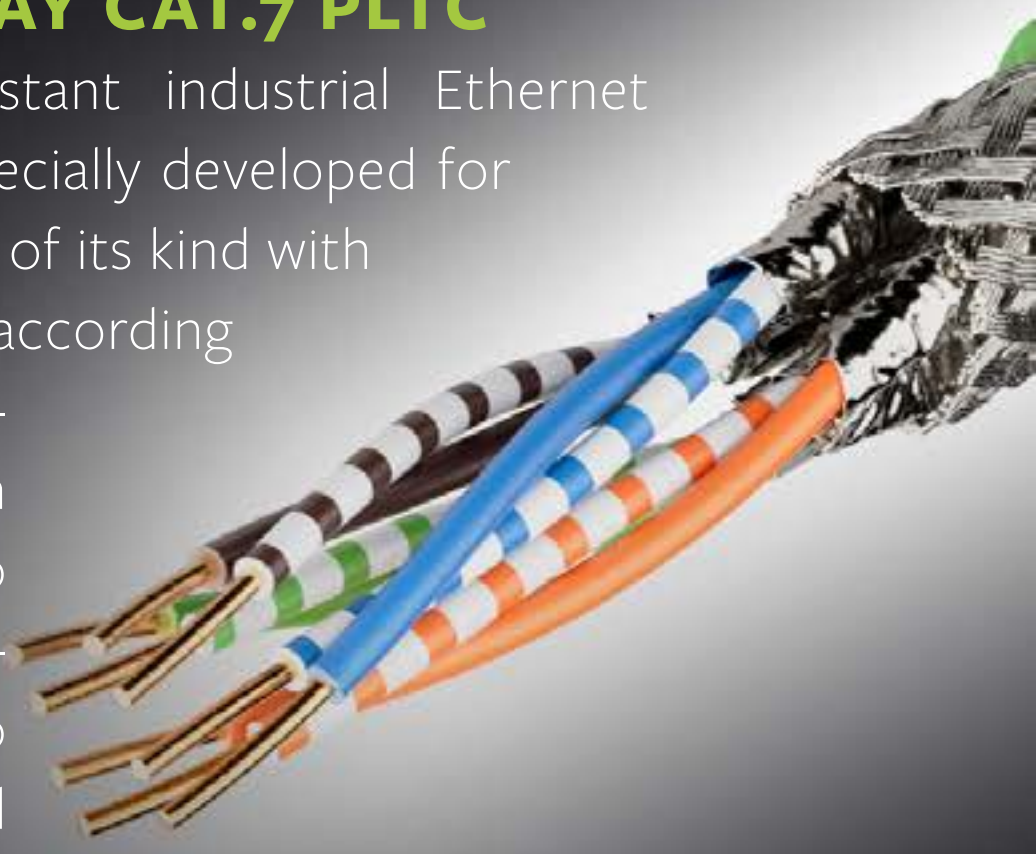
Lapp offers a comprehensive portfolio for all applications and protocol standards used in industrial communication – from a single source and incorporating the manufacturer's own expertise. The company also has several new data transmission systems in its portfolio that are offered specifically for use with Ethernet technology:

ETHERLINE LAN 1000 CAT.7A

The high-transmission 4- or 8-pair Ethernet cable (Cat. 7A) is suitable for structured building cabling within LAN networks and all Ethernet applications (IEEE 802.3) up to 10GBase-T. It is used to transmit analogue and digital signals in the frequency range up to 1000 MHz.

ETHERLINE TRAY CAT.7 PLTC

This robust, oil-resistant industrial Ethernet cable (Cat. 7) was specially developed for the USA. It is the first of its kind with PLTC classification according to UL and can therefore be laid openly on cable trays. Thanks to the high-speed transmission rates of up to 10 Gbit/s and the ideal shielding, it is suitable for universal use



at machine interfaces for data and signal transmission applications.

ETHERLINE PN CAT.6A FC

This data cable is suitable for fixed installation in the Profinet network (type A). Thanks to its Fast Connect design with a separating cross between the pairs of conductors, the UL-certified Ethernet cable (Cat.6A) can be assembled particularly quickly. The Cat. 6A performance guarantees transfer rates of up to 10 Gbit/s in the frequency range up to 600 MHz.

ETHERLINE PN CAT.6A FLEX FC

This was developed for flexible use in Profinet networks (type C): It is suitable for industrial secondary and tertiary cabling in accordance with EN 50173-3 ISO/IEC 24702 for machine, equipment and control-cabinet cabling.

Photo: Lapp

The Etherline Tray Cat.7 PLTC is a robust, oil-resistant Industrial Ethernet cable and was specially developed for use in the USA.

ETHERLINE PN CAT.6A FD FC

The Etherline PN Cat.6A FD FC is particularly tough for highly flexible drag chain applications in Profinet networks (type C): Thanks to its Fast Connect design, the UL-certified Ethernet cable (Cat. 6A) can be assembled very quickly and has excellent EMC properties.

Web-Guide:
www.lappkabel.com

Make automation more productive!

PILZ AT SPS CONNECT 2020 – FOCUS ON SAFE AUTOMATION SOLUTIONS FOR COMPREHENSIVE ACCESS CONTROL.

Under the exhibition slogan “Be safe and secure with Pilz”, Pilz will be using the virtual platform of the international exhibition SPS – Smart Production Solutions (24 – 26.11.2020) to showcase safe automation solutions for smart and digital automation. These solutions consider machinery safety and industrial security in equal measure. The main area of focus is comprehensive access control while maintaining productivity. Product innovations from the sensor technology range PSEN (Pilz sensor technology), the operating and monitoring range PMI (Pilz Machine Interface) and the configurable safe small controllers PNOZmulti 2 complete the digital presence. The company will also be presenting new products from the drive technology portfolio PMC (Pilz Motion Control) at SPS Connect.

Product innovations from the PSEN (Pilz sensors), operation and monitoring and the PNOZmulti 2 range of configurable safe, compact control systems will round off the digital exhibition presence. The company will also be presenting innovations from the drive technology portfolio PMC (Pilz Motion Control) at SPS Connect.

Photo: Pilz GmbH & Co. KG

THE FOCUS: SENSOR TECHNOLOGY SOLUTIONS THAT ARE PRODUCTIVE AND ECONOMICAL

Safety gate solutions need to be economical and also productive, even when it comes to access. The range of safety gate systems includes the safe, mechanical safety gate system PSENmech, now with guard locking. PSENmech with guard locking keeps the safety gate safely closed until the hazardous machine movement has stopped and prevents an unintended restart of the hazardous movement as long as the gate is open. It represents an economical, basic solution for the safe monitoring of movable guards.

There's also an addition to the modular safety gate system: a handle module is now available for the safety gate sensor PSENmlock: the PSENmlock handle module combines a handle with integrated actuator and escape release in one solution. It's quick to install and simple to operate. So the user has an all-in-one modular safety gate solution for safe interlocking and safe guard locking. In addition there are new types

Good analogue alternative: under the exhibition slogan "Be safe and secure with Pilz", Pilz will be using the virtual platform of the international exhibition SPS – Smart Production Solutions (24 – 26.11.2020) to showcase safe automation solutions for smart and digital automation.

of safety laser scanner PSENscan available, which enable even greater productivity. That's because the 17-pin types and ME (master encoder) type of PSENscan provide users with further digital inputs and outputs.

HIGHER PERFORMANCE VISUALISATION

For professional visualisation of plant and machinery, Pilz offers solutions in which PMI (Pilz Machine Interface) becomes the link between human and machine. The panels PMIvisu v807 and PMIvisu v812 are now being added to the PMI product portfolio to provide even higher performance in this area. These panels complete the Pilz portfolio of visualisation panels and, in conjunction with Pilz control technology, offer a comprehensive system solution, even for web-based visualisation. The new, high-performance series consists of the robust PMI v8 Panel and the web-based visualisation software PASvisu.

EVEN THE SMALL CONTROLLER PROVIDES WIDE-RANGING SUPPORT

New elements are now available for the configurable small controller PNOZmulti 2, from software version 10.13 of the corresponding software tool PNOZmulti Configurator. These enable the simple configuration of safe user programs, which can be run by the PNOZmulti 2.

The same applies to the safety gate sensor PSENmlock in the modular safety gate system, which has had another element added for the configuration of the signal sequence during interlocking and release. What's more, PNOZmulti 2 now offers an L-muting element for muting in light curtain applications.

With these new elements, the user can implement the wide-ranging requirements for monitoring safety functions even more efficiently.

EFFICIENT DRIVE SOLUTION!

Saving space and rapid commissioning of machinery are also challenges for drive technology applications. With the new drive controllers PMC SC6 and PMC SI6, Pilz is expanding its portfolio to include servo amplifiers for either single or multi-axis applications. Both drive controllers are characterised by their compact design: an overall width of 180 mm is all that's needed in the control cabinet for six axes. For rapid commissioning, parameters for the motor data are set simply and safely via the electronic motor name plate. The drive controller PMC SI6 is suitable for use in large plant and machinery from four axes and above, whereas the compact stand-alone drive controllers PMC SC6 with integrated power supply are designed for use in compact plant and machinery.

Web-Guide:
www.pilz.com/en-INT
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Stadium Tour

Right in the middle ins
of just being there: th
participants not only l
about the possibilities
interface, but also app
the stadium atmosphe

BIHL+WIEDEMANN IS IMPLEMENTING ITS ASI-5 WORKSHOPS AS A PRESENCE EVENT IN THE FORM OF A TOUR OF FOOTBALL STADIUMS.

Nothing beats direct contact between partners working together on technological issues. Bihl+Wiedemann is therefore implementing its ASi-5 workshops as presence events in the form of a Stadium Tour, which is being very well received by the participants.

COMMISSIONING THE ASI-5 MODULE TOGETHER WITH OTHERS

The participants in Bihl+Wiedemann's Stadium Tour are not only able to experience the fascination of a football stadium live and in colour: they can also learn why the AS-Interface is the right choice for a multitude of automation tasks and why ASi-5 is paving the way into the digital future. At the stadium, experts show the participants how easy it is to plan an ASi-5 network and how ASi-3 and ASi-5 can be put into operation. The contents of the workshops include not only the technological basics of ASi-5 and the benefits of the new ASi-5 products from Bihl+Wiedemann but also how to extend ASi-5 using ASi Safety. Live demos explain how IO-Link devices can be integrated cost-effectively, how ASi-5 can be integrated into the Profinet world and how roller drives and inverters can be controlled by means of ASi-5. Participants can test the technology for themselves on exhibits and, for example, learn about the benefits of AS-5, such as the direct setting of ramps for controlling drives – all this in front of an impressive

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Photos: Bi… Wiedemann

backdrop. An ASi cable connected to an ASi-5/ASi-3 fieldbus gateway is laid across all the participants' tables. This allows each participant to connect an ASi-5 module during the event and to easily commission the application together with the others.

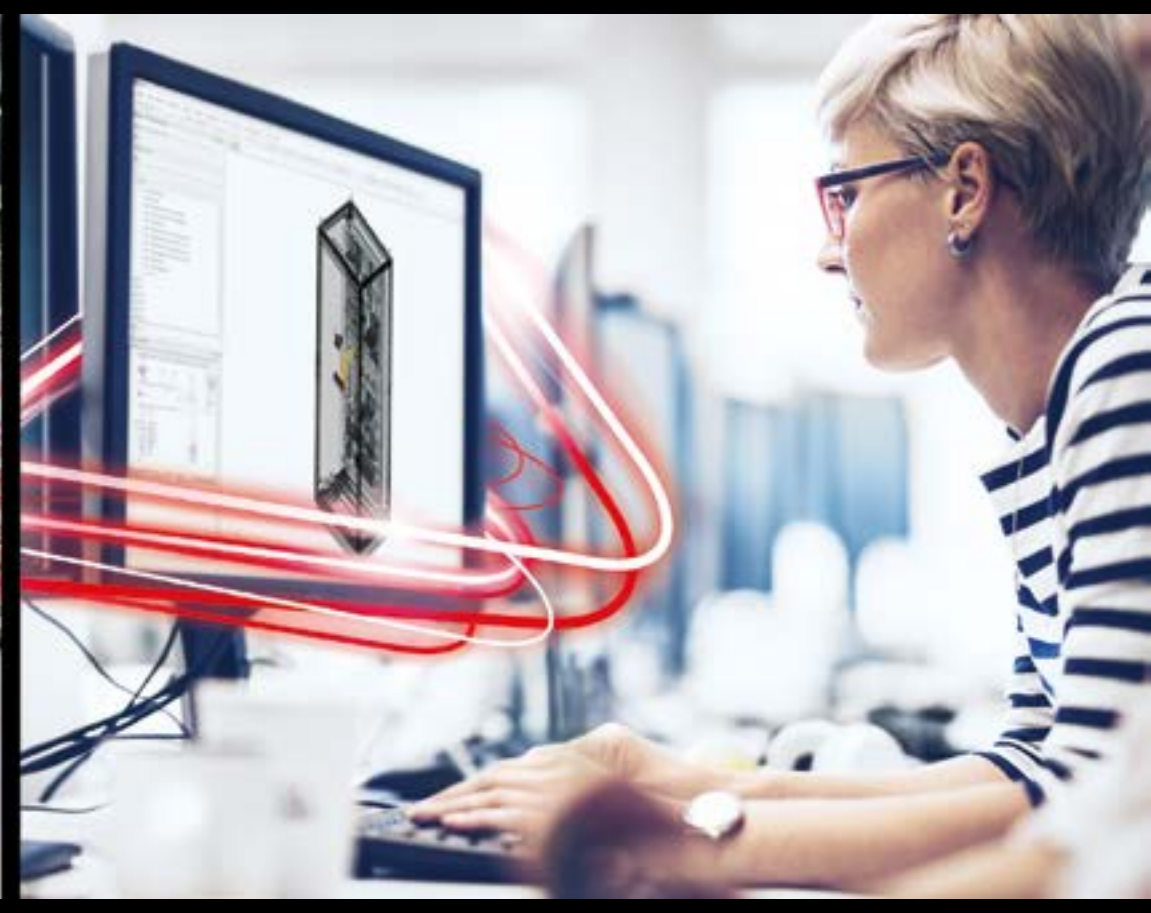
CONSTRUCTIVE ATMOSPHERE FOR DISCUSSIONS

The first event was held at the Veltins Arena in Gelsenkirchen on 1 September 2020. It quickly became clear how much the numerous participants welcomed the personal interaction. The first participants were already in the stadium an hour before the scheduled start. The atmosphere was extremely positive and, while adhering to the hygiene concept, a very constructive atmosphere was created where possible solutions for automation tasks could be discussed personally. All the participants have had a good and safe feeling during the workshops that have been held so far and were happy to meet up with experts once again.

Practical cooperation: during the event, each participant had the opportunity to connect an ASi-5 module and together with others, simply put the application into operation.

CONCRETE ENQUIRIES AND SPECIFIC QUESTIONS

Concrete enquiries and specific questions characterised not only the discussions at the home of Schalke football club in Gelsenkirchen, but also those at the following events of the tour on 9 September at the wohninvest Weser Stadium



in Bremen, on 1 October at the Lanxess Arena in Cologne and on 14 October at the Allianz Arena in Munich. Here, too, there was huge interest in the topics covered: in Bremen, for example, the last participants did not leave the workshop until an hour after the end of the event.
The programme for all of the Bihl+Wiedemann workshops also included a visit to the respective stadium. Here the participants could get a feel for the football stadium atmosphere and take a look behind the scenes.

IT WILL CONTINUE IN 2021

The workshops offered numerous opportunities for intensive networking and an exchange of ideas with the speakers and the ASi specialists from Bihl+Wiedemann. Because of its great success in 2020, Bihl+Wiedemann's Stadium Tour will be continued in 2021 – the dates for the next events are already being planned.

Web-Guide:
www.bihl-wiedemann.de/en

Photo: auremar/AdobeStock

VIDEO:
support arm system from Rose

Rose Systemtechnik delivers its panel PCs with the DeviceImage data backup software from Waxar on request

Rapid response when a machine breaks down

ROSE SYSTEMTECHNIK OFFERS ITS CLIENTS A HIGHLY EFFICIENT DATA BACKUP SYSTEM

The data from industrial PCs need to be backed up well so that the machines can resume operation quickly after a malfunction. Besides supplying its panel PCs, Rose Systemtechnik therefore offers data backup software. This solution is unique on the market because it works independently of the operating system and even saves data that conventional backup programs cannot record.

Almost every machine or system today has a programmable logic controller (PLC) or an industrial PC (IPC). If these controls fail, the whole machine comes to a halt. Furthermore, there is always a loss of sensitive data when a controller fails, and a lot of effort is then needed to restore the data – assuming that the controller data has been carefully backed up beforehand.

BACKING UP DATA OFTEN PRESENTS COMPANIES WITH PROBLEMS

This is not always easy, though: compatibility problems arise when different operating systems coexist, when the data from the machine controls are not available in file format or when the data-backup software interferes with the operating system and impairs its function.

Rose Systemtechnik therefore offers its clients its own data backup software: the DeviceImage technology, which was developed by Waxar Data Saving Systems. The software is bit-based. This means that the technology also creates a back-up of the data that falls through the cracks of conventional backup solutions.

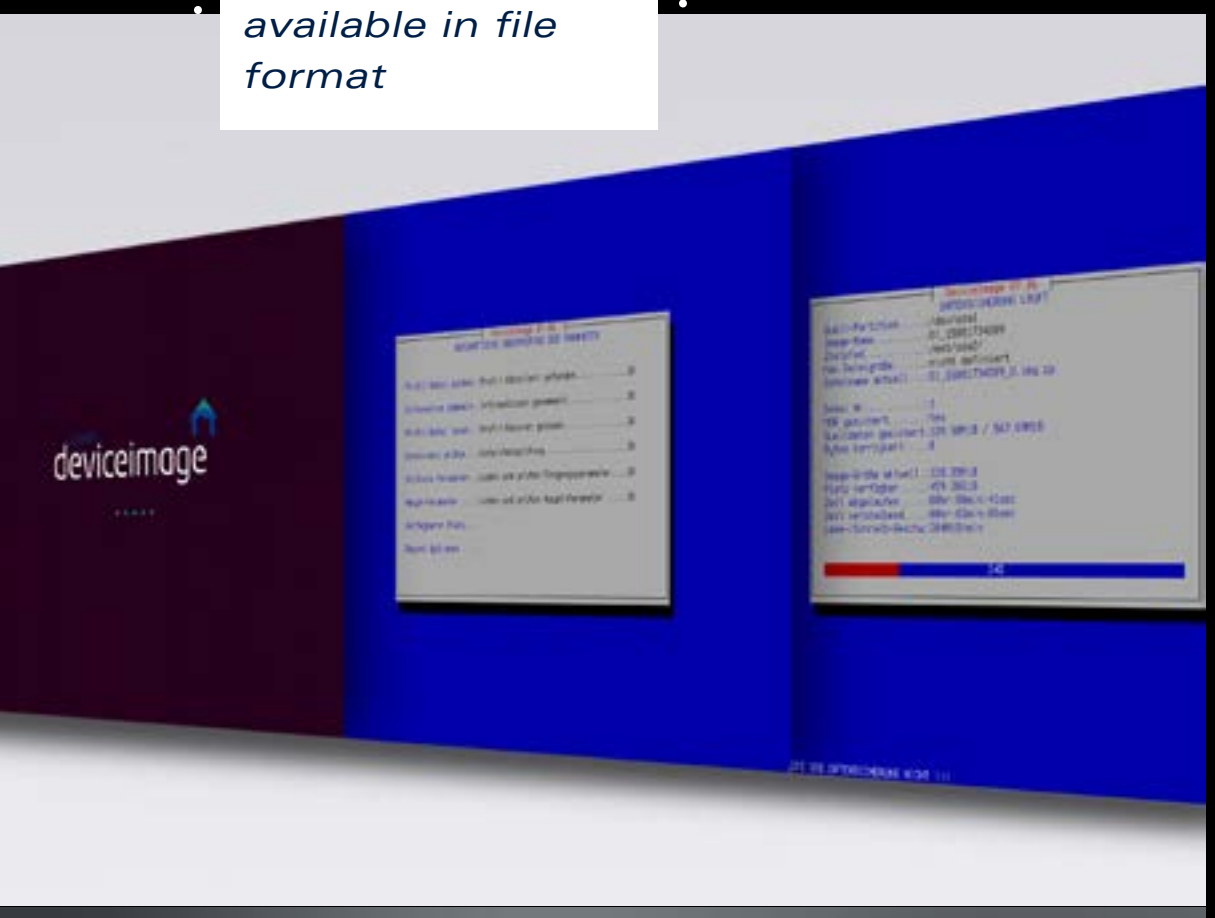
A further benefit of the software is that it is independent of the machine controller's operating system. "Our software is supplied on a USB stick, which the user only has to insert into the USB port of the machine controller," says Waxar founder Dr Jurij Ivastsuk-Kienbaum, explaining the principle. "The data backup can be started with just a few clicks and requires no IT expertise whatsoever."

HMI units consisting of control housing, panel PC and support arm system from Rose allow machines and systems to be operated easily

THE BACKUP IS INDEPENDENT OF THE OPERATING SYSTEM

Besides the software, the USB stick also has sufficient capacity to hold the data to be backed up, so an additional storage medium is not required. The backup itself is carried out quickly: “It takes about five minutes with the usual data volumes of 20 to 60 GB,” says Dr Ivastsuk-Kienbaum. The high speed is linked to the bit-by-bit backup and would not be possible with conventional, file-based methods. The DeviceImage technology allows the machine’s data to also be restored within a short time – downtime is thus minimal.

DeviceImage is easy to use and also records data that is not available in file format



In contrast to the usual backup solutions, the fact that the DeviceImage solution also boots separately from the actual operating system means that it can also work in the event of a virus infestation of the controller. For the user, this functionality has another positive effect: DeviceImage does not alter the operating system.
Data encryption is also carried out directly behind the interface. “This means you can even store the data in the cloud without any worries – there’s no danger of it being hacked,” asserts the IT professional.

Industrial panel PCs from Rose can be adapted to any application

Web-Guide:
www.rose-systemtechnik.com
www.waxar.eu

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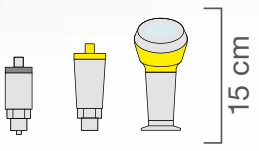
Compact capacitive level switches with 360° custom-colour status display

256 colours

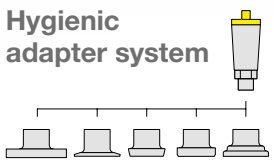
Individually selectable:

- Measurement in progress
- Sensor switching
- Process malfunction

Compact design



Hygienic adapter system

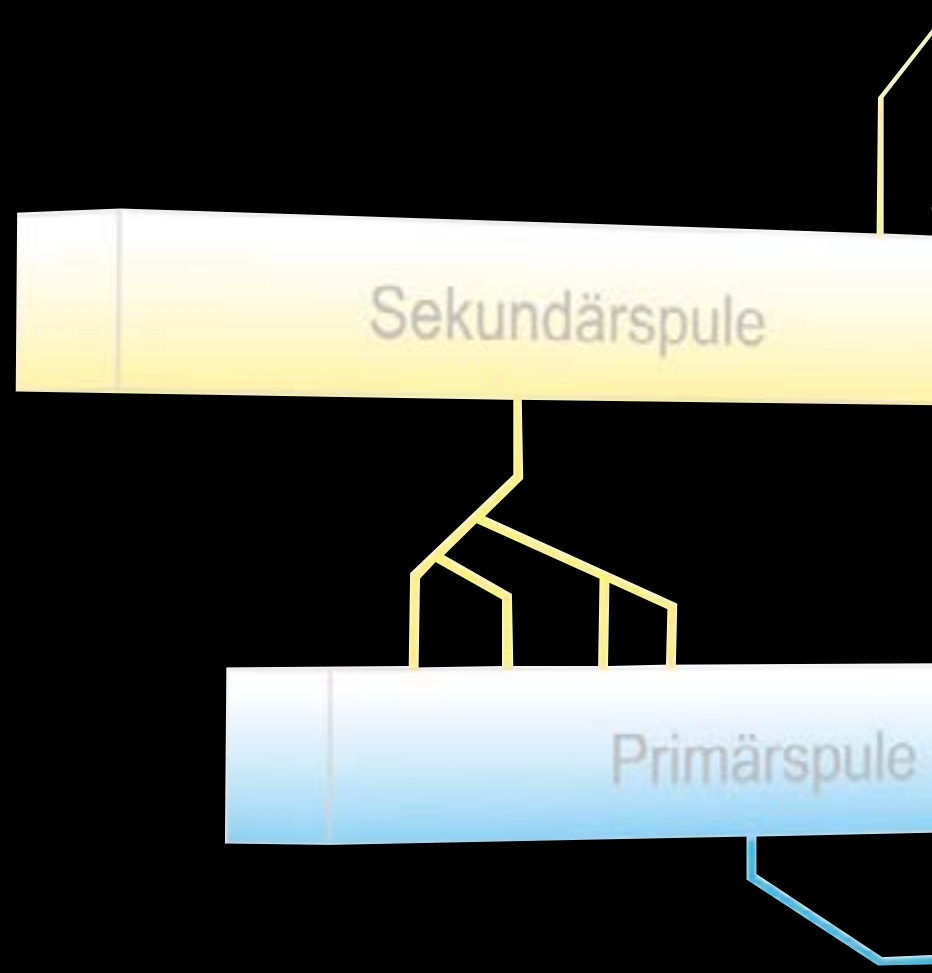


IO-Link

Adjustment via smartphone

www.vega.com/vegapoint

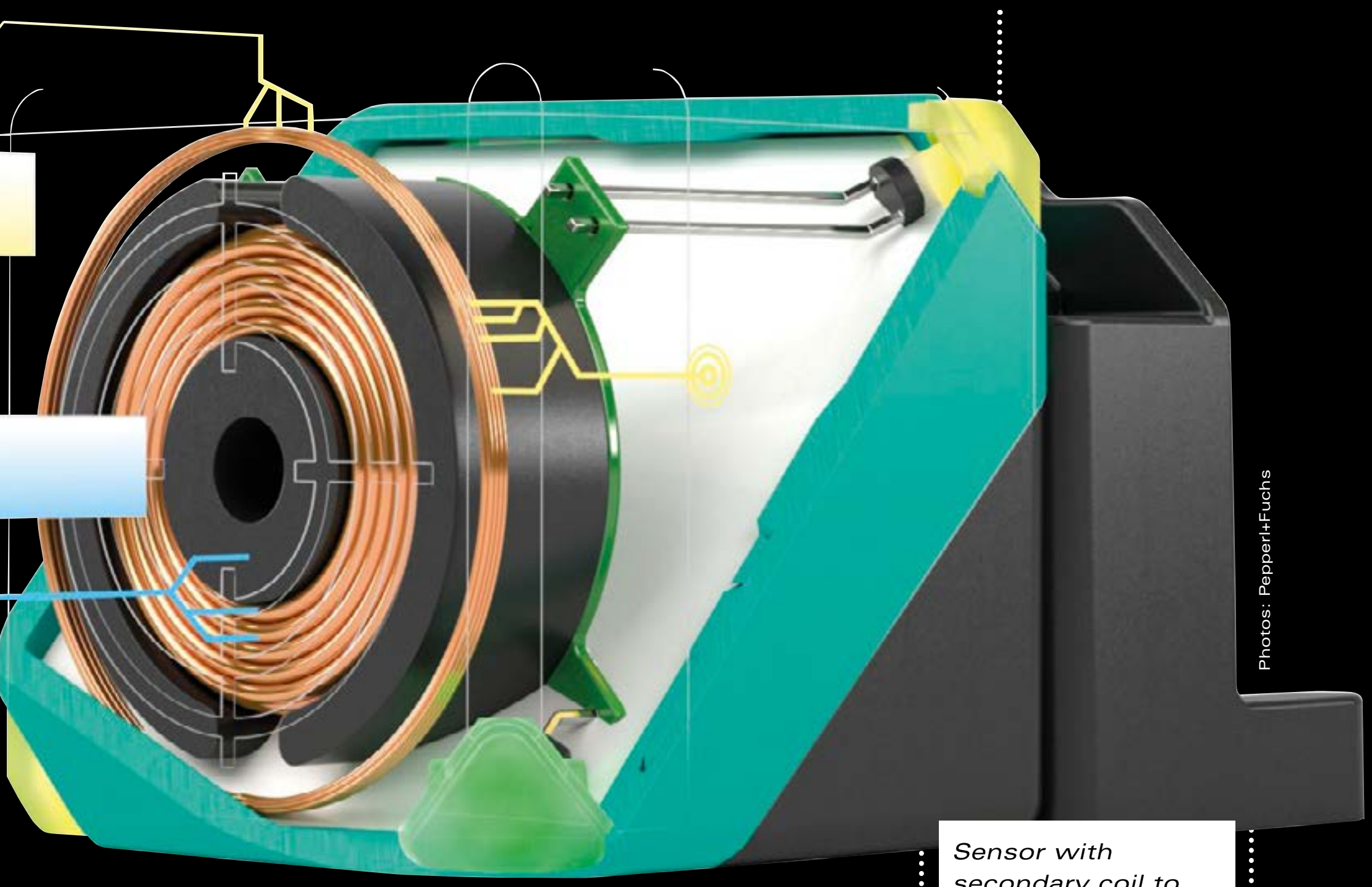
Looking Forward VEGA



Inductive proximity switches with stable high switching distan

ACTIVE SHIELDING TECHNOLOGY COMPENSATES FOR INTERFERENCE AND ENSURES ROBUST OPERATION.

The installation conditions for sensors like inductive proximity switches differ from machine to machine, often seriously affecting their functionality. Especially in the case of proximity switches with greater switching distances, this often leads to deviations between the actual and nominal switching distances, sometimes considerably more than the ±10 % permitted by the standard. The new Active Shielding Technology solves



Photos: Pepperl+Fuchs

Sensor with secondary coil to detect installation situations.

nces

this problem with an additional compensation coil. It detects the disturbing influences of the environment and allows the electronics to adjust the sensitivity of the main coil precisely, so that the switching distance always remains stable over the desired range.

With increasing switching distance, it becomes more and more difficult for inductive proximity switches to maintain the nominal switching distance while ensuring stable operation. Pepperl+Fuchs has therefore modified its popular VariKont range to include a number of models that are equipped with Active Shielding Technology and use a special compensation coil. The newly developed method enables the switching distance to be increased from 20 mm to 30 mm for flush-mounted sensors and

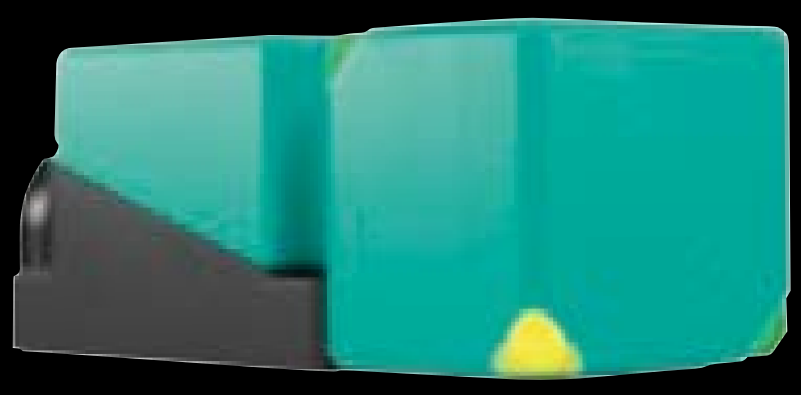
AT A GLANCE:

Consistently high switching distances regardless of the installation situation thanks to Active Shielding Technology

- greater flexibility: large switching distances – up to 30 mm if flush-mounted and 50 mm if non-flush-mounted – for greater design flexibility
- particularly simple status control thanks to corner LEDs visible on all sides from every angle.

from 40 mm to 50 mm for non-flush-mounted versions. These values are stable for almost any kind of installation situation and for any orientation of the sensor head. Furthermore, Active Shielding Technology ensures that it does not matter whether the surrounding installation material is steel, stainless steel or aluminium. The new proximity switches are available for the cuboid-shaped VariKont and VariKont L sensors. The classic VariKont model has a separate terminal compartment and indicator LEDs that are visible all-round for status control, while the more compact VariKont L model is connected via a plug connection.

VariKont model as version with terminal box and M12 plug



HOW ACTIVE SHIELDING TECHNOLOGY FUNCTIONS

In devices with Active Shielding Technology, a coil for measuring external influences replaces the classic metal shielding frame. The latter limits the maximum possible switching distance by pre-damping the resonant circuit, whereas the coil allows active compensation of influences resulting from the installation. To achieve this, the electronics had to be redeveloped completely. This has resulted in the new VariKont models that are characterised by a previously unattained level of precision and stability, and have increased switching distances at the same time. The new sensors are not intended to replace tried and tested standard models, but rather to provide users with options for mastering challenges in difficult situations or increasing process reliability. The inductive proximity switches are available in 3- and 4-wire technology on the output side and operate on supply voltages of 10 up to 30 V DC and at ambient temperatures of -25 up to +70 °C.

Web-Guide:
www.pepperl-fuchs.com
Please visit us at SPS Connect

Photos: Balluff

VIDEO:
TrIm Video: The new BCM multifunctional condition monitoring sensor records different physical measurements

Condition monitoring made easy

Dr. Detlef Zienert

THE NEW BCM MULTIFUNCTIONAL CONDITION MONITORING SENSOR FROM BALLUFF SETS NEW STANDARDS.

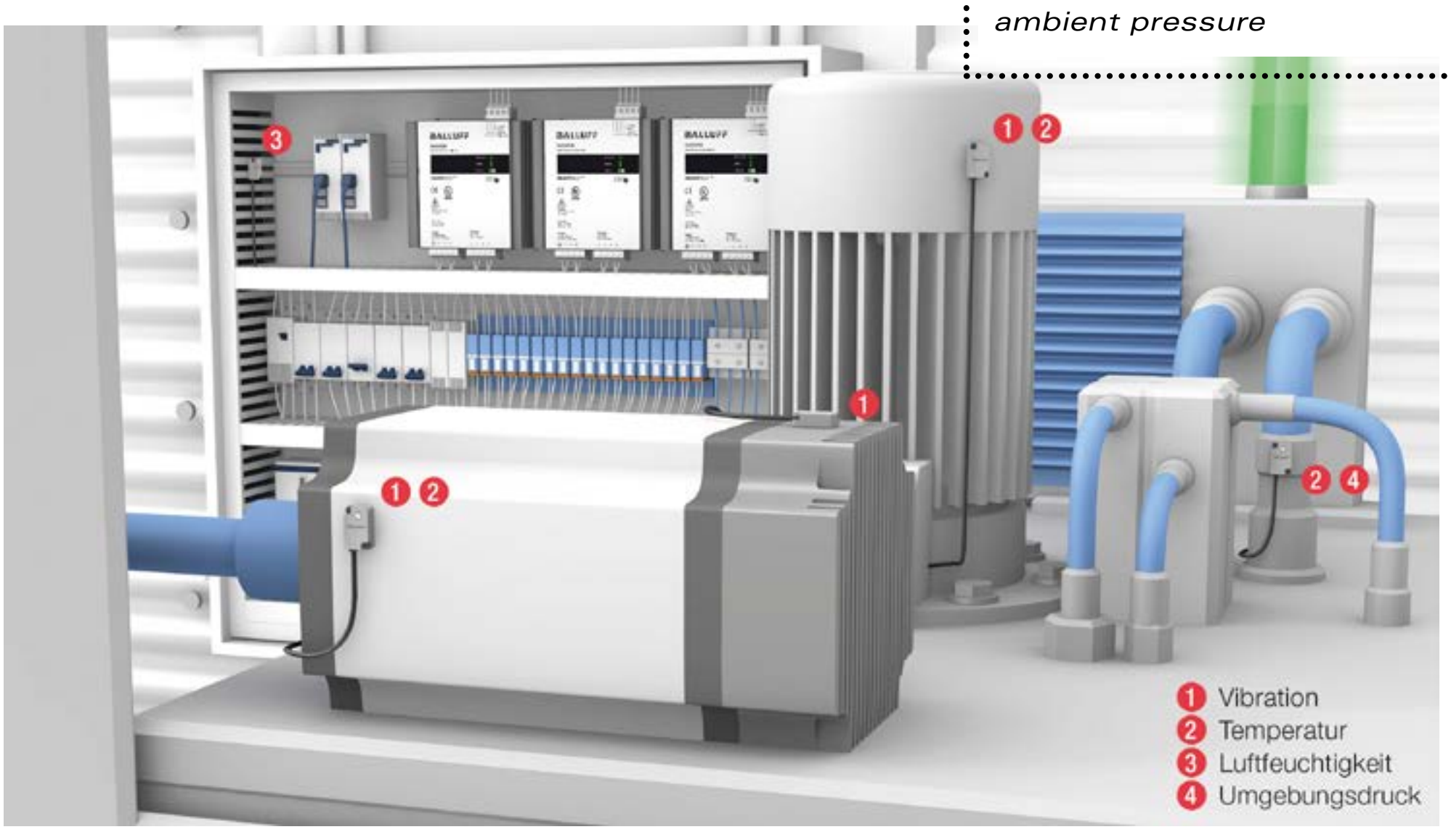
The easily retrofitted all-rounder records various physical measurements such as vibration in three axes, temperature, humidity, ambient pressure, etc. and processes these directly on board. Based on this status data, self-defined limit values can be monitored automatically, anomalies detected at an early stage, maintenance and repair planned in advance and unplanned downtimes thus avoided.

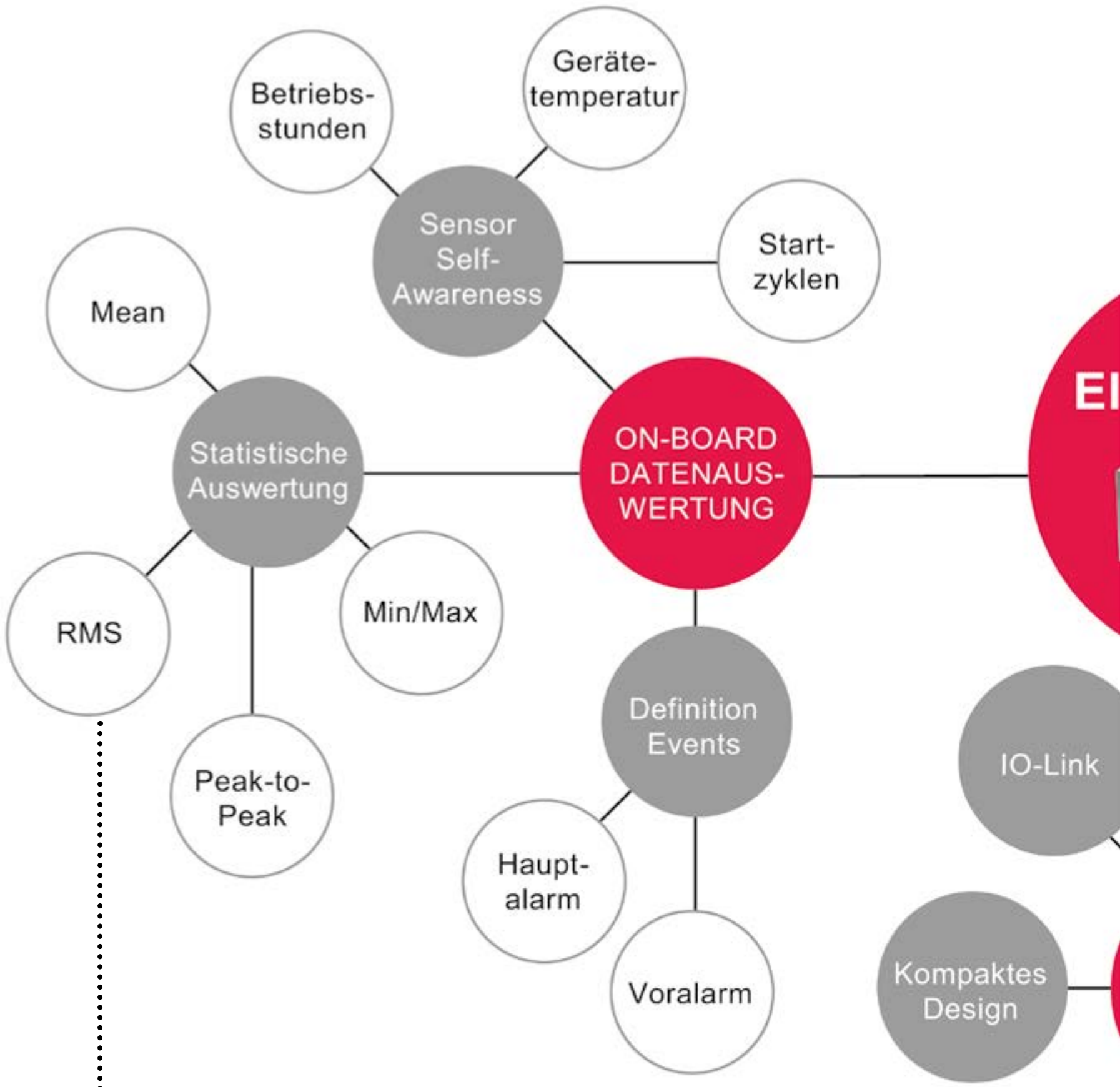
FLEXIBLE PARAMETERISATION VIA IO-LINK

As a communication protocol, IO-Link enables simple and industry-oriented integration into the plant and machine environment as well as flexible parameterisation. The evaluation in the sensor can be adapted perfectly to every application in this way. The content of the process data can be defined by the user. Up to five measured or pre-processed items of data can be selected and transmitted cyclically. In addition, acyclic querying of further statistical processing variables is possible.

In the case of automated monitoring, limit values for pre-alarms and main alarms can be defined for measured or evaluated variables, so that the sensor generates warning messages for certain events and makes them directly available via status bits. The sensor thus makes a significant contribution to the efficient and trouble-free operation of any plant and significantly increases its effectiveness.

Application scenario with monitoring of vibration, temperature, humidity and ambient pressure

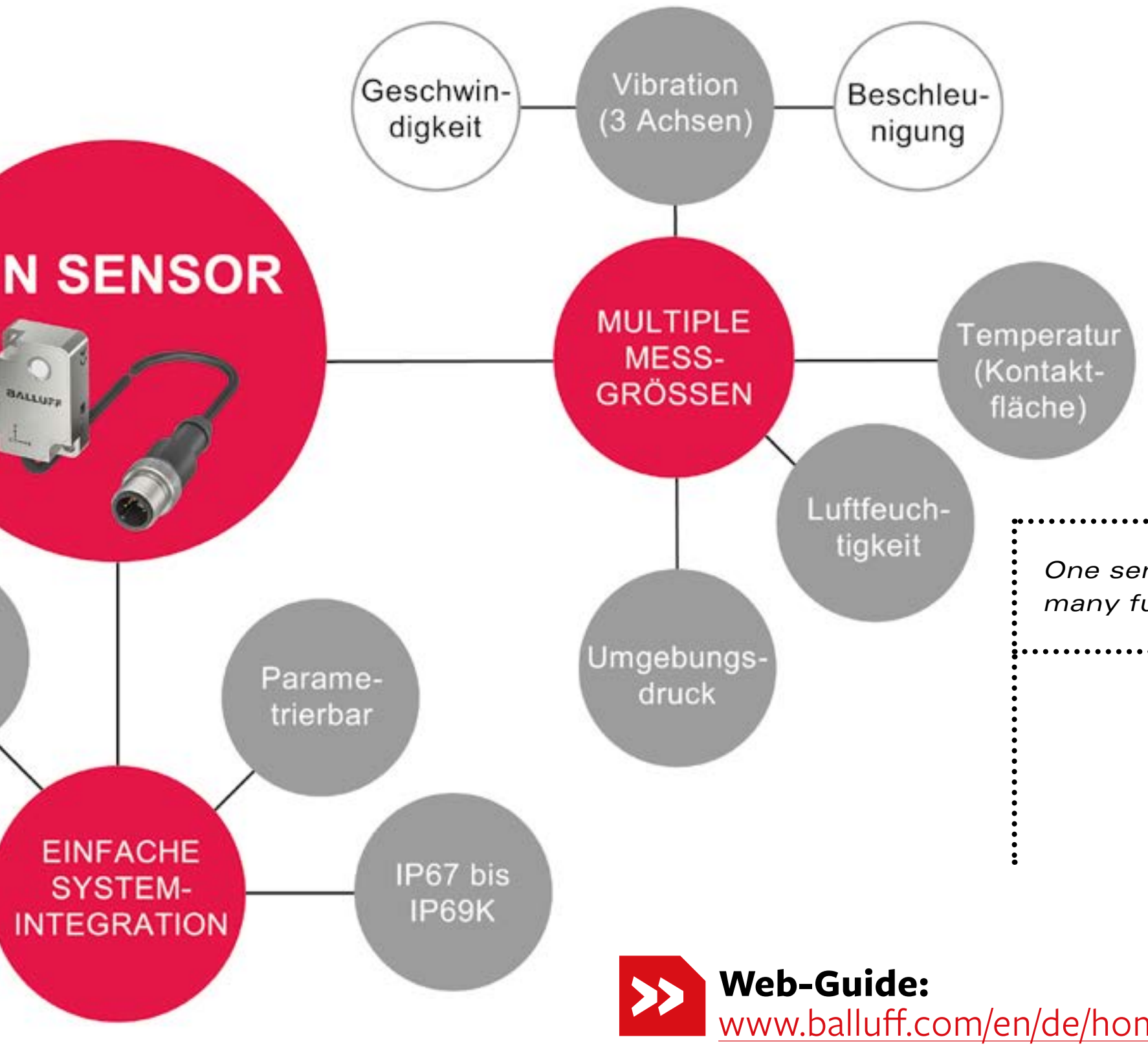




PREPROCESSING OF THE MEASURED VALUES IN THE SENSOR

The data are aggregated and preprocessed in the sensor. This means that the user has access to meaningful information and statistical values directly from the device without the need for additional software and without having to use separate evaluation units, and this data can then be used immediately for analysis and evaluation purposes.

Thanks to its small size, 20 mm x 26 mm x 10 mm, and weight, approx. 30 g, the compact condition monitoring sensor can be installed even in the tightest spaces. This means that there are almost no limits to its diverse applications in machines and plants.



One sensor, many functions

Web-Guide:
www.balluff.com/en/de/home/
Visit us on the SPS Connect

IP67 PLC with Direct Cloud Connection

THANKS TO ITS INTEGRATED EDGE GATEWAY, THE ROBUST TBEN-L PLC WITH PROTECTION TO IP67 CAN BE CONNECTED DIRECTLY TO TURCK'S CLOUD PLATFORM FOR STRAIGHTFORWARD MACHINE CONTROL AND MAINTENANCE.

Photo: Turck

With its cloud connection the TBEN-L PLC now also handles the tasks of an edge gateway.

Turck has introduced the new TBEN-L PLC as the world's first IP67 controller for industrial applications, which not only offers an onboard Codesys PLC but also enables a cloud connection and communication with different Ethernet protocols at the same time, thanks to its multiprotocol technology. The Dual MAC mode enables the robust module to establish a connection to the automation network via one port and a securely separated internet connection to the cloud via the second port. Alternatively, if an internet connection to the cloud is not required, communication in two Ethernet networks is possible, for example as a Profinet device and as Profinet, Ethernet/IP or Modbus TCP master.

DECENTRALIZED AUTOMATION CONCEPTS WITH MINIMAL EFFORT

The ability of the IP67 controller to connect at the machine directly to Turck's Cloud Solutions not only eliminates the need for additional edge gateways but also considerably simplifies project design for the user. This makes it possible to implement decentralized and network concepts with a minimum of installation effort and expenditure. Compared to applications with a separate edge gateway, the programming of this kind of solution with an integrated cloud connection saves considerable resources since no interfaces for data exchange are required.

DIAGNOSTIC DATA ON ANY DEVICE AT ANY TIME

Simple access to machine data in the cloud from any PC or mobile device worldwide simplifies fault diagnostics and maintenance as well as condition monitoring for preventative maintenance. The cloud interface supplies a clear presentation of the states of sensors and other machine data in a browser application. These dashboards can be created by the user without any programming knowledge. Limit values such as temperature, pressure or vibration can be set easily and actions for limit violations defined. If necessary, the Turck Cloud can send an SMS or email directly.

Web-Guide:
www.turck.de/en/

SPS Connect 2020

Visit us online!

The fast way to easy installation: *blue*globe TRI

Installing an EMC cable gland can be very time-consuming – but it doesn't have to be. The blueglobe TRI from PFLITSCH impresses not only with its high screening attenuation properties, but also with its simple, quick and reliable installation that saves time and money.

For more information, go to **www.pflitsch.de**

PFLITSCH

Passion for the best solution

The digital FieldEcho service of Sick Integration Space parameterises and monitors all IO-Link devices in a plant and provides a modern, web-based graphical user interface.

Photos: Sick

Go beyond

IMPLEMENT DIGITISATION, THINK FURTHER IN INDUSTRY 4.0

The digital services of Sick Integration Space integrate, network and visualise smart sensors in digitalised automation structures.

They are available everywhere, far too rarely are they refined: data are the rough diamonds and the basis of all digitisation. Intelligent sensors unearth this treasure – and digital complete solutions from Sick Integration Space make the rough diamonds sparkle. In presentations and during round table discussions at the SPS Connect web fair – the digital version of the SPS fair – Sick will be showing what smart sensors can do as data suppliers for the networked and digital world.

It will also be presenting complete digital solutions – based on intelligent algorithms and perfected by artificial intelligence. In addition, experts from the company will be available to answer questions in live chats and virtual meetings. Extensive information material for downloading will round off Sick's digital offer.

As the technology leader and a reliable partner, the company will be taking its customers into the real world of Industry 4.0 with 'Go beyond'– Sick's motto for its digitisation campaign. Smart sensors – embedded in intelligent and individual, digital complete solutions – make data-based, networked and autonomously controlled processes and value chains in production and logistics

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Informationen auswerten, Parameter anpassen. Alles in einer Software.
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moneo|configure SA (SA: Stand- Alone) unterstützt Sie bei der Parametrierung Ihrer IO-Link Devices und ifm IO-Link-Master.
Die visualisierte Darstellung im Cockpit vereinfacht die Einrichtung und Fehlerdiagnose. Die komfortable Verwaltung von Parameterdatensätzen beschleunigt die Integration neuer Sensoren zusätzlich und wird ergänzt durch die integrierte Online-Verbindung zum IODD-Finder.

Bereit für mehr?
Dann starten Sie jetzt Ihre digitale Evolution mit **moneo**, der neuen, offenen und branchenunabhängigen IIoT-Plattform von ifm.

ifm – close to you!

moneo.ifm

possible and controllable. Whether it is flexibility in production, condition monitoring, predictive maintenance, artificial intelligence applications or sensor solutions programmable via Sick AppSpace, the limits of what is technically possible and sensibly feasible are constantly being redefined. Under the 'Go beyond' motto Sick will therefore be offering sustainable innovations for existing concepts, while at the same time opening up countless new opportunities.

SICK INTEGRATION SPACE: DESIGNING DIGITAL INTEGRATION INDIVIDUALLY AND IMPLEMENTING IT PROFESSIONALLY

Sensors from Sick measure, detect, identify, monitor, control, and protect – and they also provide valuable data from processes and their environment. Sick Integration Space's digital services such as the Block Factory function, an open universal solution for creating IO-Link function blocks, or the FieldEcho integration tool, which is suitable for all manufacturers, integrate, network and visualise smart sensors in digitised automation structures. Application-related digital services enhance sensor data using intelligent algorithms, refine them into data solutions, perfect them with the help of artificial intelligence and integrate them – adapted to meet customised requirements – into web-based applications. Users benefit from improved performance of their business processes – whether it be via transparent and networked procedures in their factory automation, via smart mobility and transport solutions for their logistics, via concepts for safety-oriented productivity, via vision and robotics solutions or via individual life time services.

Web-Wegweiser:
www.sick.com
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Photo: auremar/AdobeStock

During the SPS week from 16.11. to 20.11.2020, live information will be available online daily from 8.30 to 9.30 a.m. after registration

E-CAD powered by WSCAD

DURING THE 'SPS WEEK', WSCAD WILL BE HOLDING AN ONLINE SESSION FOR AN HOUR EVERY MORNING – THE FOCUS WILL BE ON THE INTERACTION WITH SCHNEIDER, SIEMENS, PHOENIX AND WAGO.

Drawings and diagrams created in different systems are often passed on as DWG data. The upcoming Suite X Metal with its completely revised data logic is therefore supporting this format. The time saved is enormous, especially with large machine plans and building

schematics that contain several hundred thousand elements: open, change, save – done. Conversion and the associated time-consuming import and export of data that was necessary previously is eliminated completely. The improved program logic is also reflected in faster zoom behaviour. Suite X Metal will only be available for 64-bit operating systems because of the need for a large address space in modern applications. In this context, a new analysing tool checks whether all the necessary framework conditions are suitable before installation. If there are any deviations, the user immediately receives suggestions for adapting the system environment.

PERFECT BUILDING AUTOMATION

Technical building suppliers, building automation companies, planning offices and electrical installation companies need information transparency and efficient tools for carrying out engineering economically in the building sector. Suite X is exactly right here: it enables continuous transparent planning to be carried out across different disciplines on a single platform and without data breaks. If a symbol from the circuit diagram is linked to a symbol from a system diagram, all the data points recorded, including their values from the diagram, via the electrical and circuit diagram through to the terminal on the controller (DDC/PLC), are immediately available for further processing. Components from the installation planning are completely linked to the building automation scheme including all cables and designations. I&C companies that manufacture their control cabinets themselves use all the data immediately for the control cabinet layout and subsequent production.

CABINET ENGINEERING FUNCTIONALLY EXTENDED

Increasingly, users are turning to the Cabinet Engineering module to produce cables, wire harnesses, cabinet housings and mounting plates on NC machines. This eliminates the additional time required for mechanical design and the mechanical CAD system required to do this. To speed up the design work, Cabinet Engineering has therefore been expanded to include mechanical CAD functions. To ensure exact placement and movement of components, dimensions can be entered manually, and relative distances are displayed.

Web-Guide:
www.wscad.com/en/

The Suite X Plus has been available since summer 2020 in the three expansion levels Compact, Professional and Ultimate and supports electrical designers and building automation engineers engaged in electrotechnical planning in the fields of electrical engineering, process and fluid technology as well as in designing the control cabinet, building automation and planning the electrical installation.

“Digital Enterprise – partnering for the ne

AT ”SPS CONNECT”, SIEMENS WILL BE PRESENTING FLEXIBLE SOLUTIONS AND SERVICES FOR INDUSTRIAL COMPANIES UNDER THE MOTTO ”DIGITAL ENTERPRISE – PARTNERING FOR THE NEXT STEP”.

Therefore, Siemens is expanding its digital enterprise portfolio with future technologies and bringing intelligence to product design and production. At the virtual event ”Digital Enterprise SPS Dialogue” on 26.11.2020, customers and journalists will have the opportunity to discuss topics in personal conversations in detail and discover further highlights in 3D in a virtual showroom. This will include innovations and new products for the Industrial Edge portfolio. The company will be showing the Industrial Edge Management System, a centralised and company-wide scalable infrastructure for the management of connected Edge Devices and Apps. With the new Industrial Edge Management System, users monitor the status of each connected device and remotely install Edge apps and software functions on the desired Edge devices. In combination with the hardware and software already available, they now have the open platform Industrial Edge V1.0 as a ready-to-use and integrated solution. In the field of drive technology, Siemens is expanding its Mindsphere application Analyze MyDrives to include a corresponding Edge version.

xt step”

Siemens-SPS-Visual-2020_medium: Join us live on November 26 at our Digital Enterprise SPS Dialog. Explore our 3D presentations of SPS highlights in our brand new virtual showroom. Be inspired by top speakers and numerous practical examples from industry. Ask questions and discuss with us – just like you would at the trade fair – this time virtually.

Photo: Siemens

This is the first time the company is introducing an edge application for drive technology to the market and demonstrates how edge computing and cloud computing can be intelligently linked. The Sinamics G115D, a new decentralised drive system specially developed for use

in horizontal conveyor systems, will also be presented. Sinamics G115D is a complete drive system comprising motor, frequency converter and gearbox in one unit. With the Simatic Robot Library for the Simatic Robot Integrator, Siemens presents a new universal robot library for the TIA (Totally Integrated Automation) portal. With the help of the Simatic Robot Library, users will be able to program a large proportion of the robots on the market in the TIA Portal, regardless of the manufacturer, and to use uniform operating concepts based on the Simatic Robot Integrator and Simatic HMI.

CONTINUOUS ACCESS FOR IIOT APPLICATIONS

Danach weiter mit: As a basis As a basis for current and future IIoT applications, Siemens will be showing innovative cloud-connect products for continuous data access. With the new Power over Ethernet (PoE) variants of the Scalance XC-200PoE, XR-100PoE WG and XR-300PoE WG industrial Ethernet switches, up to 26 end devices can be supplied with data and power over one FastConnect data line. All new PoE switches feature the latest IEEE 802.3bt standard. With Module Type Package (MTP), Siemens presents a solution for plant operators who want to expand their production quickly and flexibly or switch to a new product.

SUPPORT CUSTOMERS IN THEIR DIGITAL TRANSFORMATION

In the Siemens Digital Enterprise Services area, the company is presenting Connectivity Services, which support customers in the context of a digital transformation to connect existing field-to-edge and cloud assets or integrate new software solutions. New Remote Collaboration Services for fast and comprehensive remote fault diagnosis, troubleshooting and commissioning will also be on display.

The use of artificial intelligence to optimise plant performance continues to play an important role: for example, in new offerings such as Predictive Services, which can be used to optimise maintenance intervals, or factory optimisation services, which use simulation to virtually map existing or planned plants and optimise processes and production as a whole.

Web-Guide:
www.siemens.com
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The birth of the adaptive machine

Stefan Hensel

SMALLER BATCH SIZES, SHORTER LIFECYCLES AND ONLINE RETAILING ARE PRESENTING MANUFACTURERS OF PACKAGED CONSUMER GOODS WITH NUMEROUS NEW CHALLENGES.

„To ensure smooth production, it is essential that each product is exactly reproducible at a specific point in time and at a unique location.“

Wlady Martino,

packaging expert at B&R

A new type of machine will help meet these challenges: the adaptive machine.

An Instagram post from a popular influencer is enough to cause a rapid increase in the demand for a particular product. Within the first hour alone, thousands of consumers order the coveted consumer item. And within 24 hours the entire stock of all online shops has been used up. Wholesalers immediately increase their orders to the manufacturer – and the manufacturer is suddenly faced with an unsolvable task: it is impossible to produce the unexpected orders within the short time available.

"Until recently, this scenario was still just a pipe dream, but now more and more machine operators are telling me the same story," says Wlady Martino, industry expert for the packaging industry at B&R. "So we've reached a point where conventional machines can no longer keep up with the demands of the manufacturing industry and, ultimately, consumer demand."

FOUR NEW CHALLENGES

All in all, Martino has identified four major challenges that are facing manufacturers of packaged consumer goods in particular:

- Product diversity is increasing rapidly.
- Batch sizes are becoming more and more variable.
- Product demand is fluctuating strongly and unpredictably.
- The life cycle of individual products is becoming ever shorter.

Photho: Wöhrle B&R

Smaller batch sizes, shorter life cycles and online retailing: the adaptive machine must be able to meet these challenges.

VIDEO:
Machine-Centric Robotics at SPS 2019

„The machine simply adapts to the product to be manufactured – hence the name adaptive machine “

Wlady Martino

"The whole world is talking about a batch size of one as being the biggest challenge for production in the future," says Martino. "But when I talk to machine builders and operators, it turns out that it's not only batch size that's posing new challenges. It's rather the combination of more and more product variants that have to be produced in widely varying batch sizes and at very short notice."

Another factor is the life cycle of the products. Whereas in the past products were produced and packaged uniformly for several years, this period has been shortened in some cases to one year or less. Seasonal or special offer goods are often produced for only a few weeks. "And then there's the extreme case of completely individual products," adds Martino. These are produced only once in a batch size of one piece.

FOUR CHARACTERISTICS OF THE ADAPTIVE MACHINE

Packaging machines have become more and more flexible in recent years, but even this flexibility is no longer sufficient to cope with the new demands. That is why a new type of machine is needed. Martino: "We call this new type the adaptive machine."

It must exhibit four core characteristics:

- economical production of small batch sizes
- no downtime when changing formats
- ability to manufacture products that are not yet known
- rapid market availability for new products.

If product diversity increases and batch sizes become more and more variable, changeover times will have an ever-greater influence on the availability and productivity of a machine. An adaptive machine must therefore be able to change formats at the push of a button and ideally even produce different products simultaneously.

"And since new products or product variants are constantly being demanded, an adaptive machine must also be capable at all times of manufacturing products that weren't even

known when the machine was developed," says Martino. This is where the name adaptive machine comes from – the machine simply adapts to the product required in each case. It greatly reduces the time to market for new products.

FOUR TECHNOLOGIES FOR THE IMPLEMENTATION

To implement the adaptive machine, it is necessary to merge existing and new technologies into a new overall solution. These technologies are essentially:

- track systems
- vision systems
- robots
- digital twins.

Conventional machines used in discrete manufacturing operate almost exclusively sequentially, i.e. with a conveyor belt and hence synchronised processing stations. Martino is convinced: "An adaptive machine cannot be implemented on this basis." Therefore intelligent transport systems, so-called track systems, form the backbone of the new machine type. They enable each product to be transported individually through the production process. In addition, time-consuming processes can be parallelised by splitting the product flow to several processing stations by means of switches and then merging them again afterwards.

"With intelligent track systems it's even possible to clamp products between two shuttles and transport them in this way," adds Martino. In principle, each product can therefore be individually shaped and dimensioned without the need for retooling. The software simply automatically adjusts the distance between the two shuttles to the product being transported.

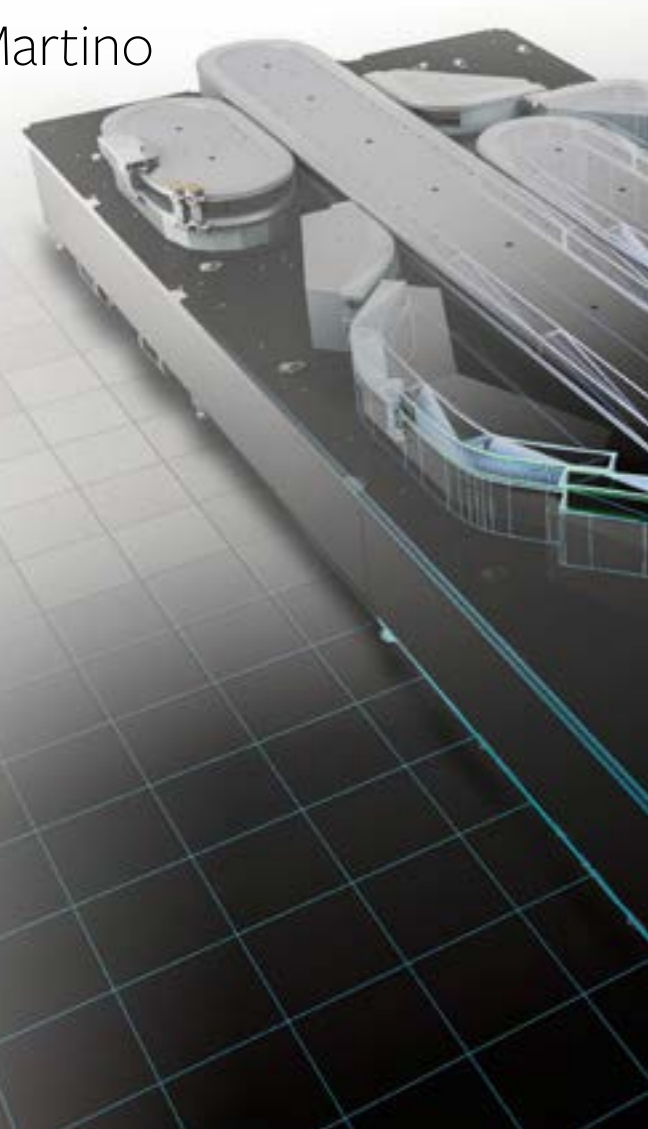
EYES FOR THE MACHINE

To ensure smooth production, it is essential that each product is exactly reproducible at a specific point in time and at a unique location. However, if the products or their packaging are constantly changing, it would be far too much effort to manually adjust the mechanics accordingly each time.

"But there's a solution to this challenge," says Martino. An intelligent vision system automatically recognises the shape, orientation and size of a product and can transmit this information to a robot in less than a millisecond. The robot picks up the product at lightning speed and places it with the desired orientation on a shuttle of a track system.

DIGITAL TWIN REPLACES PROTOTYPE

"By combining these hardware technologies in a uniform system, we make it possible to adopt completely new approaches to production," says Martino



Digital twins enable new products to be manufactured with virtually no changeover time and without the need for prototypes.

enthusiastically. However, these can only be implemented in reality if the necessary software is also available.

According to Martino, besides having uniform and user-friendly automation software there is one aspect that is particularly important: simulation. “Without a digital twin, we will not be able to manufacture new products virtually without changeover times and prototypes,” he says. The digital twin makes it possible to simulate the complete process even before production begins. In this way, any problems that may arise can be identified and avoided in advance.

“With an adaptive machine, manufacturers of consumer goods can respond quickly and economically to changing demand,” says Martino, summarising the benefits of the new machine type.

Web-Guide:
www.br-automation.com
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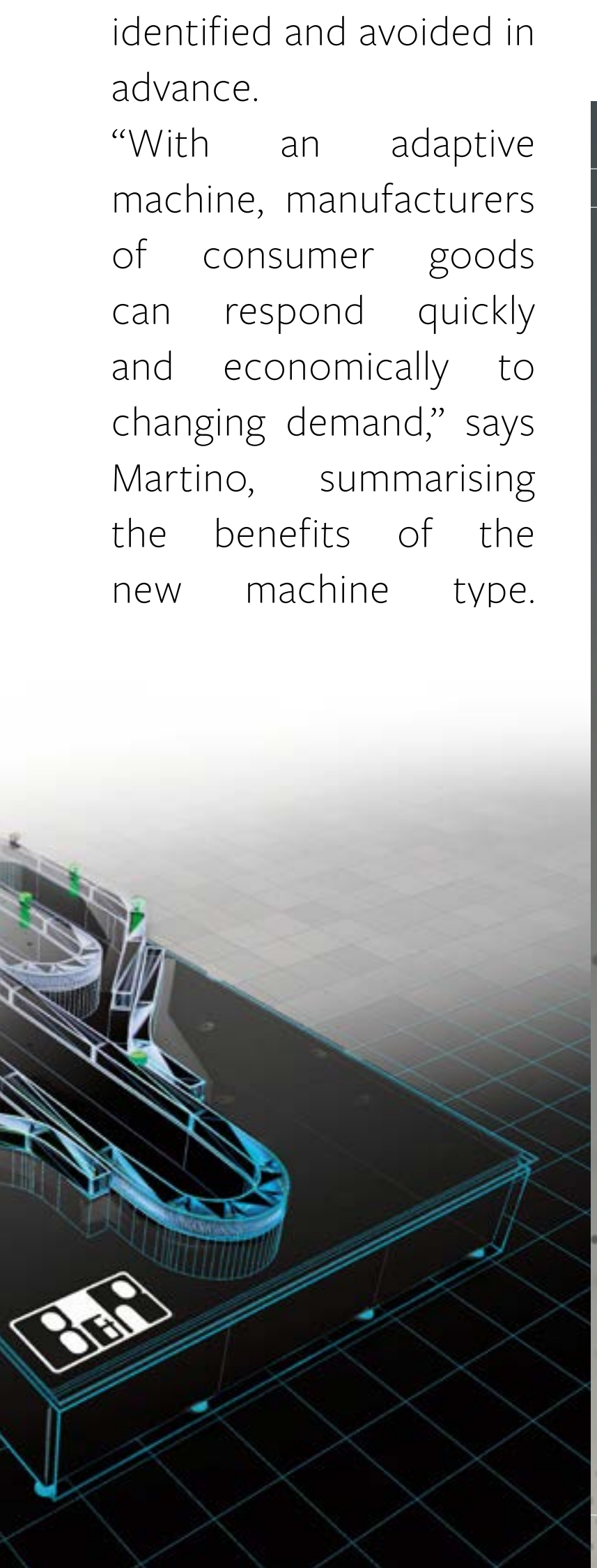


Photo: Wöhrle Stromversorgungssysteme GmbH

Microgrid electronics cabinet

Reliable microgrid system

ARE RENEWABLE ENERGIES UNRELIABLE? NOT ANY LONGER WITH WISIO FROM WÖHRLE! SUPPLY YOUR LOAD IN AN ENVIRONMENTALLY FRIENDLY, COST-SAVING AND UNINTERRUPTIBLE MANNER.

The Wisio microgrid system was originally developed for the generation of decentralised island networks but thanks to its flexibility and intelligent electronics it makes it possible to use alternative energies as a reliable power supply with a high level of availability in other applications as well.

The UPS functionality including the lithium battery means the power supply to the connected load is ensured without interruption even when the conditions are less than ideal for power generation.

The microgrid system supports the widest possible range of energy sources and can therefore be used not only in remote locations, but also has the advantage that renewable energy can be used to supply critical loads as well.

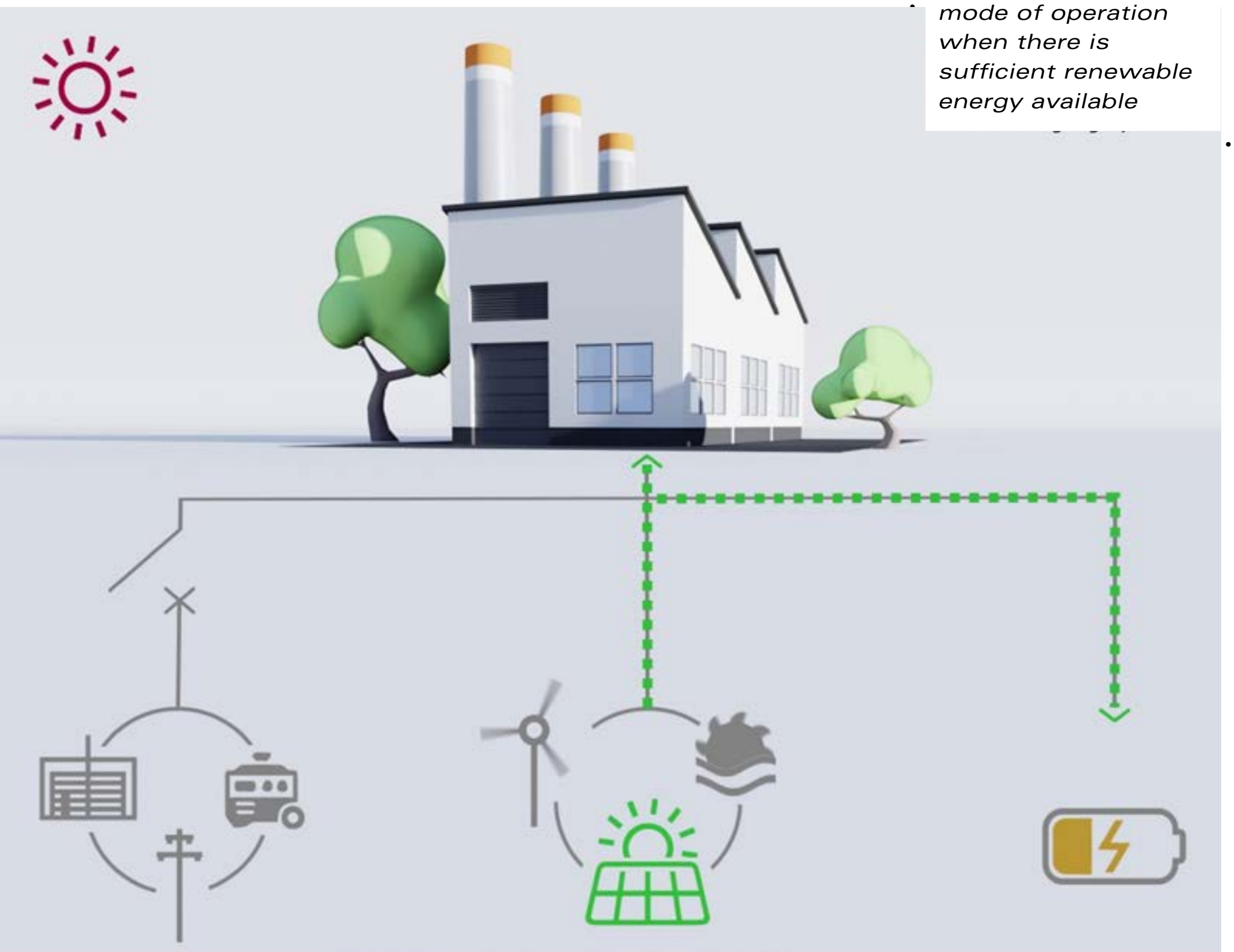
Since renewable energies are very volatile, it would be too unreliable for sensitive loads to be supplied solely from such sources. With the help of Wisio, however, renewable energies can be used efficiently and cost-effectively in a fail-safe manner. When not enough alternative energy is being generated, the microgrid system switches automatically to another working mode without interruption and uses conventional electricity from the adjacent grid, a CHP or a diesel generator.

In this way, the microgrid system always ensures that the load is supplied continuously and economically.
The system can also be used in peak-shaving applications.
The highlights of the system at a glance:

- intelligent and automatic switching of the working mode
- highly efficient with a high energy density
- modular and hot-swap capable
- safest possible lithium battery technology with 15-year lifetime
- efficient use of solar energy using MPP tracking
- comprehensive system security.

The Wisio microgrid system from Wöhrle: simple, reliable, efficient.
Further information about the system is also available at SPS Connect.

Web-Guide:
www.woehrle-svs.de



Presentation of the mode of operation when there is sufficient renewable energy available

Photos: Rittal GmbH & Co. KG

New VX IT rack system

BUILDING EDGE INFRASTRUCTURES FASTER WITH THE NEW RITTAL VX IT RACK SYSTEM.

The new VX IT rack is a solution that can be used anywhere. It is available in a modular format for even greater freedom for the rapid deployment of data centres.

Speed is of the essence. Due to the industrial transformation, manufacturing companies are having to build new IT and OT infrastructures for edge applications faster than ever before. The prerequisites are rack systems based on a comprehensive modular range of variants that can implement individual solutions simply, safely and in a future-proof way. The answer to these demands is the new Rittal VX IT rack system.

New technologies such as the Industrial Internet of Things (IIoT), Artificial Intelligence (AI) or 5G all demand reliable IT and OT infrastructure systems – directly where production is taking place – for edge applications. For companies to remain competitive, the IT and OT infrastructure must be quickly set up or expanded to help provide the computing power required. Rittal offers help in this with its new VX IT rack system. This innovation is a pacesetter for the rapidly emerging new and future-proof IT and OT infrastructures.

A STATE-OF-THE-ART ENCLOSURE PLATFORM IS SETTING THE PACE

A new generation of IT racks – in the shape of Rittal's VX IT – has been developed. It is the world's fastest IT rack. Conceived as a universal and modular variant kit, the solution can be used as a network and server enclosure in a variety of edge applications. An additional factor and benefit for customers is that all VX IT variants designed with the configurator have already been tested and certified with all their components in accordance with international standards such as UL 2416, IEC 60950 and IEC 62368. This means there is no need to additionally certify the finished, configured system. This ensures maximum freedom and peace of mind when assembling new IT infrastructures. With this solution, IT managers can save valuable time in planning and procurement, while at the same time being assured that all the compo-nents work in perfect harmony.

An online configurator guides the user step-by-step through the selection of components and it directly performs a plausibility check: https://www.rittal.com/vx-it/en/it-rack.

DIGITAL ORDERING PROCESS

With VX IT, companies can implement new infrastructures at unprecedented speed, from a single network rack in the production building to a complete edge data centre in distributed production facilities. For this purpose, Rittal maximises the full digitalization potential to the benefit of its customers. The entire process from selection, configuration and ordering through to delivery is digitally supported and transparent. During configuration, the 3D model is assembled piece by piece, including the accessories. The finished 3D model is available for reuse by the user.
VX IT offers compatibility with existing Rittal RiMatrix systems and other IT infrastructures assembled with Rittal components and thus provides high investment security.

Web-Guide:
www.rittal.com
www.friedhelm-loh-group.com
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"VX IT personifies speed, flexibility and modularity. It also gives our customers the peace of mind of knowing that they are ideally equipped for all IT scenarios the future might bring."

Uwe Scharf, Managing Director of Rittal's Industry and IT Business Units and Marketing, states

DEAR READERS,

The year 2020 will certainly be an enormous test of our psychological resistance, i.e. our ability to survive difficult life situations without lasting impairment.
For me as editor-in-chief of Konstruktion & Entwicklung, SPS has always been the annual conclusion in Nuremberg for the past 8 years - a very pleasant one. So that we can also celebrate an conclusion in times of Corona, we also meet. Not in Nuremberg, but digitally. At the SPS Connect.

I am looking forward to it - stay loyal to us and stay healthy

Kind regards

Tim Bartl

Tim Bartl chief editor
KONSTRUKTION & ENTWICKLUNG