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Messe Frankfurt Group

A welcome from the organiser

SPS Vice President Sylke Schulz-Metzner from trade fair organiser Mesago: "The SPS community is a strong one." | 06

Between fairs

"We are confident," says SPS Vice President Sylke Schulz-Metzner when asked whether SPS - Smart Production Solutions 2020 will take place. In this interview you will discover the reasons for this optimism. | 08

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THE DIGITISATION ADVENTURE

Digital transformation has been given a real boost!

Erik
Schäfer



OPTIMISM INSTEAD OF STAGNATION

We are publishing this issue of SPS compact during an exceptional period when our everyday life is being determined by measures to contain the coronavirus, measures that are restrictive in part. It is the first of two issues planned for 2020! Why are we publishing it now? Because we want to present to you companies that are showing what has happened since SPS 2019, the 30th SPS – Smart Production Solutions. And a lot has happened! We hope you find this issue innovative and exciting and that you share our confidence that SPS 2020 will be able to take place in Nuremberg from 24-26 November 2020 as planned ;-)

Erik Schäfer, Editor-in-Chief KONSTRUKTION & ENTWICKLUNG

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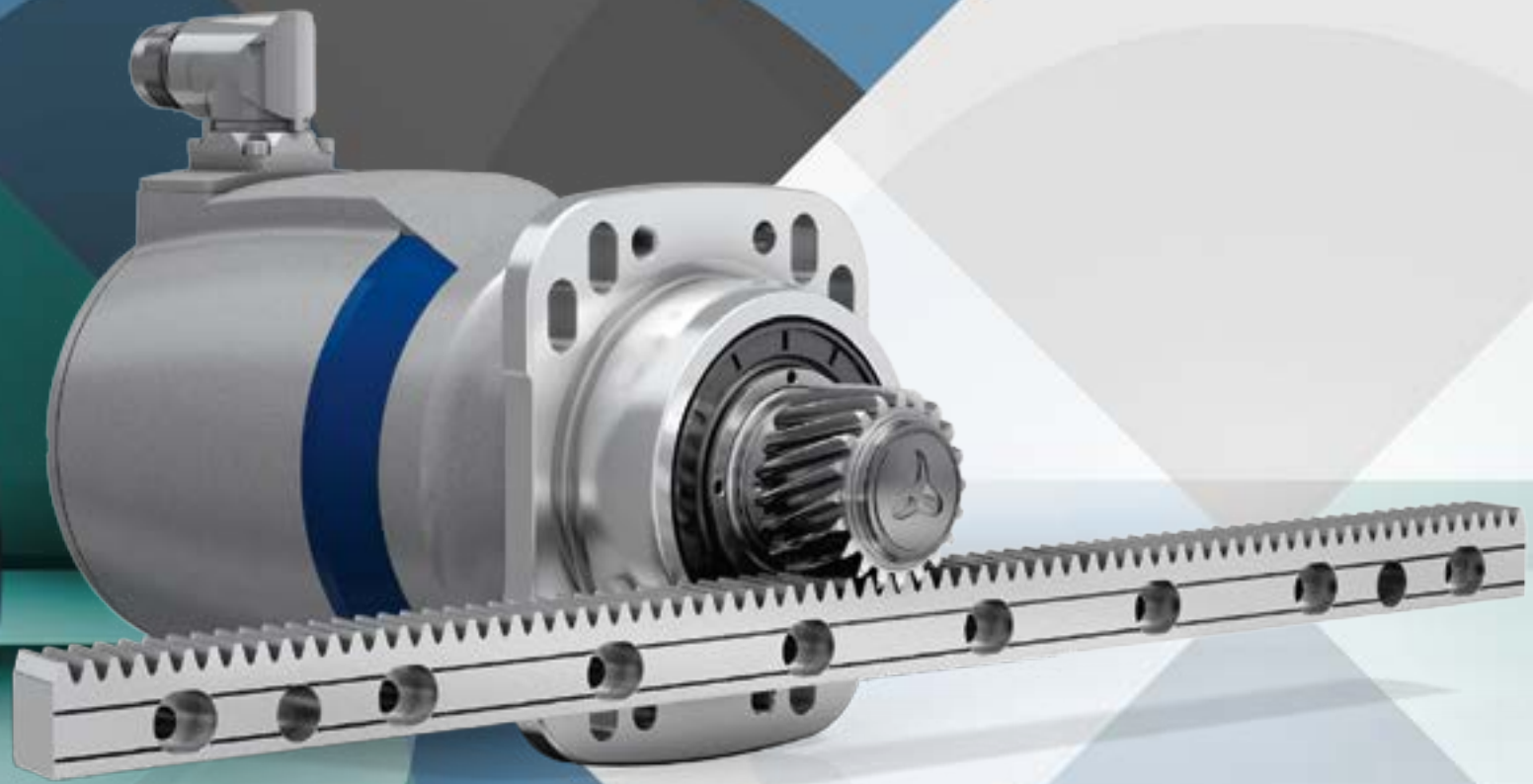
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Photo: Mesago



Photo: Erik Schäfer

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2020



Photo: Erik Schäfer



Photo: Endian

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DEAR READERS

2020 is a great challenge for us all. The state of emergency is hitting the economy and the Corona crisis is affecting everybody, both privately and professionally. The resulting reduction in opportunities for personal encounters demands a strong sense of community - and that is the SPS community. In recent weeks we have learned even more intensively that relationships can still be fostered, even if you can't see each other face to face. Phones, Skype and other tools give us the chance to stay in touch, to exchange ideas and to be close to each other. Previously, we thought that a digital meeting couldn't replace a real one, but now we find that it does work to some extent. Where there is shadow, there is also light: digitalisation has received a considerable boost in the last few weeks with virtual conferences, webinars and other digital platforms keeping us up to date even at home.

It's good to see that the automation industry is looking straight ahead and still advancing the future.

We are reporting on the latest innovations in this issue of the e-paper. I am confident that we will be able to experience them live in Nuremberg in November. Stay healthy - I look forward to seeing you again soon!

Your

Sylke Schulz-Metzner, Vice President SPS

»SPS Smart Production Solutions is not only a trade fair that looks to the future, but one that is already focusing on practical innovations today.«

Heiko Füller, Head of Market Management, SEW-Eurodrive GmbH & Co. KG



A great event all around.
I think there is something interesting
there for every trade visitor.



Werner Münsinger, Electrical Design, Elumatec AG

»The SPS is and remains the sector highlight for the whole automation industry. Nowhere else can you meet people, companies, the press and technology relating to automation in such a concentrated and compact form.«

Martin Buchwitz, Managing Director, Packaging Valley Germany e. V.

„The SPS brings together important market players who are focusing jointly on the next goal: the transformation to I4.0.“

Dr Detlef Houdeau, Senior Director, Infineon Technologies AG

»The most important trade show in the world for automation technology.«

Georg Lutz, Sales Engineer, Siemens AG

We're confident

Erik Schäfer

THE 31ST SPS IS DUE TO TAKE PLACE IN NUREMBERG AT THE END OF 2020. IT'S DIFFICULT MAKE PREDICTIONS DURING THE CORONA PANDEMIC - BUT LET'S TRY.

Ms Schulz-Metzner, we're experiencing an unprecedented business situation worldwide. As of April, the Corona pandemic is in full swing. To what extent are you now playing out the scenario of a cancellation of the SPS, which is not due to take place until the end of November?

Sylke Schulz-Metzner: Despite the current situation, we're confident that the situation will have eased by November so

Digital services are becoming more and more common in sensor and measurement technology.

Photos: Mesago



◀◀◀
LOOKING BACK
acts and figures: that
was SPS 2019

that SPS 2020 can take place as planned and the automation industry can come together in Nuremberg to discuss current issues and possible solutions to tomorrow's challenges. The health of our employees, customers and partners is always our top priority, though. Nevertheless, it's important for us to offer the SPS community a platform. That's why we're preparing for all possible scenarios so that we're prepared for all eventualities.

After SPS's successful anniversary last year, all of the benchmarks have ceased to be valid this year. What are you basing your plans for SPS 2020 on now?

Sylke Schulz-Metzner: Trade fairs are among the strongest drivers of the economy. That's why this year we're preparing SPS 2020 as we prepared it in previous years. Only a few planned activities have had to be postponed to a later date because of the pandemic, for example our visits to our customers and partners.

Have you already received any reactions from your trade fair advisory board or from exhibitors concerning how to deal with the effects of the Corona pandemic, because the economy really needs stimulus providers like the SPS?

Sylke Schulz-Metzner: In view of the current effects of the corona pandemic and the uncertainty as to when the economy will recover afterwards, a few companies have put their trade fair planning on hold. However, we've also received a great deal of positive feedback for this year's SPS, and in this situation we can clearly see how important the SPS is as a motor and driver for the industry, and that the trade fair is a firm fixture in people's diaries. At the fair, the participants have the opportunity to engage in personal discussions, establish new contacts and strengthen existing business relationships, which may not have been possible for quite some time. We're all in this situation together and we're looking forward eagerly to the end of the pandemic.



»Trade fairs are among the strongest drivers of the economy. That's why this year we're preparing SPS 2020 as we prepared it in previous years.«

Sylke Schulz-Metzner,
Vice President of SPS

After the Hannover Messe was cancelled in 2020, Frank Blase, the CEO of Igus, spoke of ‘the year that wasn’t’. After the lockdown in many countries, life’s increasingly taking place in the digital realm. Will the SPS pick up this ball and be providing (more) digital offers?

Sylke Schulz-Metzner: New digital offers from innumerable providers are emerging every day during the current situation. In my opinion, however, these offers and platforms cannot replace actually experiencing products and solutions and, above all, holding the personal discussions that take place at a real trade fair. At best, they complement them, like this issue of an e-paper that informs readers about current innovations and developments in the industry. We’ve been enriching our trade fair with this and other digital offers for a year now and we’re trying to extend the experience beyond the three days of the fair. However, it can’t be a substitute.

More and more companies are organising their own virtual trade fairs out of necessity, such as Balluff or Universal Robots in April.

Sylke Schulz-Metzner: At the moment it’s important for all companies to maintain relationships with their partners and customers. The world still keeps on turning and at some point normality will return, and personal contact will again be possible. In the current situation it’s all the more neces-

Software & IT in manufacturing - an increasingly important topic at the SPS.



sary to use alternative channels and to show that 'we're continuing to be there for you'.

Let's come to the fair itself. SPS - Smart Production Solutions took place last year for the 30th time. What were your personal fair highlights?

Sylke Schulz-Metzner: There are always so many highlights - you spend a whole year preparing for the fair and even after doing it for almost 30 years I still look forward to the SPS every year anew. Last year I was particularly pleased that one could really feel the sense of community at the SPS. As part of the anniversary, we asked participants to send us old photos and reports of the trade show in advance, so that we could reminisce extensively, and this sense of community became even stronger at the fair.

This is the first of two issues of SPS compact this year and we're taking a closer look at what exhibitors presented at last year's SPS and how things have developed since then. How will the SPS itself develop further and what new things are planned?

Sylke Schulz-Metzner: At the moment I think we must first see where this year takes us. It's always very important for us to have our ear to the market and to react to the wishes and needs of the customers. However, I think that this crisis will help us all, especially in the digital area, and that there may still be new developments even for the SPS.



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1994



Last year SPS - Smart Production Solutions celebrated its 30th anniversary at the fairground in Nuremberg. The leading trade fair for smart and digital automation covered an exhibition area of 135,500 m², and 63,708 trade visitors and over 1,500 exhibitors from Germany and abroad met there in order to find out more about current trends in automation and exchange views. In addition, all of the participants had the opportunity to take a look at the development of the SPS fair by visiting an anniversary exhibition in the NCC Mitte building. As part of a competition, you will find below an overview of the salient features of the SPS's never-ending success story.

1995



1997



The SPS opened its doors for the first time in 1990 as SPS/PC/Drives in Sindelfingen - at that time it was still a trade fair with an accompanying congress. Altogether, 3,420 visitors and 63 exhibitors occupying over 3,500 m² of exhibition space experienced the kick-off of a modest three-day industry meeting, which

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Access to the VIP lounge at the East Entrance
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(opens one hour before the start of the fair)

1999**2000****2001****2003**

would develop into a leading international trade fair in the years that followed. Ground-breaking industry milestones from the 1990s onwards, such as making the World Wide Web, and in particular the innovations resulting from it, accessible to the public provided the event with a platform from the very beginning. This was quickly reflected in continuous growth in the number of visitors and exhibitors.

Seven years later, it was necessary to give the event more space to grow. So, the trade fair, which had been renamed SPS IPC Drives in 1991, moved to the fairground in Nuremberg and expanded from one exhibition hall to three in the first year.

While SPS IPC Drives in Nuremberg was continuing to grow in importance, the SPS Industrial Automation Fair (SIAF) was the first satellite event to be held, in Guangzhou (China) in 2009, and since then it has been regarded as the meeting place for the automation industry in Asia. The SPS IPC Drives cracked the 50,000-visitor mark a year later, and at the latest by then it proved it had become the annual highlight for an automation-enthusiastic trade audience from all over the world.

The SIAF in Guangzhou was joined by further offshoots of SPS IPC Drives,

in 2011 by the SPS Italia in Parma (Italy) and in 2018 by SPS Automation Middle East in Dubai (UAE), and these have all established themselves as successful events as well.

Something that had long become established in the vernacular of the fair's visitors and exhibitors was officially reflected in the name of the event in 2019 and took into account the digital transformation in automation technology: For the 30th anniversary event, SPS IPC Drives became SPS - Smart Production Solutions. The name of the established trade fair may have changed, but its proven concept and content remained the same.

Today, SPS stands for an international event that welcomes the who's who of the automation industry to Nuremberg for three days every year. At the fair, highly qualified trade visitors and exhibitors hold intensive discussions as equals and exchange views on the challenges of today and tomorrow. ■

2007



2010



2014



2019



Web-Guide:

www.sps.mesago.com

How is ASi-5 performing?

Erik Schäfer

**BIHL+WIEDEMANN PRESENTED ITS
AS-INTERFACE (ASi) HIGHLIGHTS AT SPS 2019.
WHICH WERE THEY AND WHAT WAS THE
FEEDBACK FROM VISITORS?**



*André Hartmann,
Sales Manager
Germany at
Bihl+Wiedemann*

AS-Interface (ASi = Actuator-Sensor-Interface), is a globally standardised fieldbus system for the first level of automation. ASi connects sensors and actuators to a controller via a single two-core shaped cable. The yellow ASi cable transmits energy and data simultaneously. An interview with SPS Kompakt, André Hartmann, Sales Manager Germany at Bihl+Wiedemann.

Mr Hartmann, the latest ASi generation, ASi-5, and your products are intended to make plant and equipment ‘Industry 4.0 ready’. What did you present exactly?

André Hartmann: At the SPS, we showed how easy it is with ASi-5 and our products to collect a lot of data - even data that is spread decentrally - simply, cheaply and efficiently and to transport it directly to where it can be used - in whatever form. Our [ASi-5](#)/ASi-3 fieldbus gateways are the key components for connecting ASi applications to higher-level control systems and as an interface between OT and IT. The gateways bring together ASi-5 master and ASi-3 master, OPC UA server and the diagnostics/fieldbus interface in a single device and are now available for almost all common fieldbus systems - optionally also with safe fieldbus protocols or as a 24-volt variant.

The integration of IO-Link via ASi-5 was also an important area

André Hartmann: The visitors were enthusiastic about the clever connection of IO-Link devices via ASi-5 - and especially about how much simpler wiring in the field is compared with Ethernet-based fieldbus solutions, with the associated cost savings. With ASi-5 you can connect IO-Link masters to the shaped cable exactly where you need them. Here, our finely graded portfolio of ASi-5 slave / IO-Link master modules with one, two or four IO-Link master ports also makes it possible to start implementing projects economically in a targeted manner and oriented to the actual requirements.

In 2018 you presented ASi-5 at the SPS. This was followed at SPS 2019 by many examples of applications. What’s happened since then?

André Hartmann: Some visitors came to the SPS with very concrete projects and started building test machines with ASi-5 components shortly after the fair. Existing ASi-3 systems have already been converted to ASi-5 to make the machines suitable for industry 4.0. ■



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



Photos: Bihl+Wiedemann

Bihl+Wiedemann’s stand at SPS 2019

Up to 50% less engineering

Erik Schäfer

BOSCH REXROTH LANDED A REAL COUP AT SPS 2019 WITH ITS CTRLX AUTOMATION PLATFORM - BUT WHAT'S BEHIND IT?



Steffen Winkler, sales director of the Automation & Electrification Solutions business unit at Bosch Rexroth AG

Mr Winkler, you say you want ctrlX Automation to break down the classic boundaries between machine control, IT and the Internet of Things. But what do you mean by that?

Steffen Winkler: Nowadays, mechanical engineering is mostly software development. Manufacturers want to be able to implement machine functionalities quickly. Developers save up to 50 per cent of engineering effort with [ctrlX Automation](#), starting with the Linux real-time operating system, via the use of app technology in any desired programming language up to intelligent and consistent engineering tools. End-users in turn expect higher productivity and easier networking. With more than 30 options for direct connection to IT and IoT, ctrlX Automation is the most connective system solution on the market.

„The numerous discussions we had at the trade fair led to many interesting projects.“

Stefan Winkler



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Which modules / components make up ctrlX Automation?

Steffen Winkler: It's a complete automation platform with all the necessary hardware and software components. The heart of the system is the new [ctrlX Core](#) controller generation, which completely eliminates the limitations on performance that have existed up to now. It decouples the hardware from the software and provides users with the most modern software architecture in the world of automation. Developers can combine apps from Bosch Rexroth that are already integrated with third-party and open-source apps, or create their own apps in any desirable programming language. The ctrlX data layer ensures there is central, authorised access to all the real-time and non-real-time data of the apps.

How did this new development go down with the trade visitors?

Steffen Winkler: The trade visitors were enthusiastic because ctrlX Automation changes the rules of the game that had existed previously and they see their requirements being met on a one-to-one basis. In terms of numbers, despite the slight decrease in the number of visitors attending the fair we were able to welcome almost 50 per cent more prospective customers on our stand than in previous years.

What's happened since you presented ctrlX Automation at SPS 2019?

Steffen Winkler: The numerous discussions we had at the trade fair led to many interesting projects. The focus of the applications is currently on handling and robotics. The extremely compact multi-axis [ctrlX Drive](#) with its integrated ctrlX Core controller means space savings of up to 50 per cent are possible. ■



Web-Guide:

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Industrial factory automation

Uwe Joos

INTERESTING INFORMATION FROM FESTO AT SPS 2019 AND THE DEVELOPMENTS THAT HAVE RESULTED: 'FASTER. BETTER. CONNECTED. DISCOVER HYBRID AUTOMATION IN A NEW DIMENSION.'

For many years, Festo has been working on connectivity for the automation of industrial movements, from mechanical components and servo drive controllers through to intelligent controls and modern cloud services. The company focuses on four aspects:

FLEXIBLE, RAPID AND COMPATIBLE ...

Festo offers a wide range of products for industrial automation - whether fully electric, pneumatic or hybrid. For many years, the focus has been on finding the best solution for the customer's application. The portfolio for electric and hybrid automation is constantly being expanded to complement the company's pneumatic product range.

With its software tools, Festo provides its customers with support in their choice of the optimum product, purchasing and after sales. During the corona crisis, it has been important to design, build and document machines within the shortest possible time. "At the moment we're finding that machines for system-relevant uses, such as the production of protective clothing and respirators, have to be commissioned in a very short time," explains Uwe Joos of the company's S4-BM Strategic Marketing department.



*The Productivity
Master from Festo*

CMMT servocontrollers are compatible in all directions. This opens up a wide range of opportunities for users to integrate the products into their control environment and/or to implement simple motor connections. Festo is gaining good experience with customers in this respect.

...AND SIMPLE

Plug and work with inexpensive drives from the Simplified Motion Series: These are designed for simple motion and positioning tasks and are easy to use, even without previous programming knowledge. Festo has experience lively interest in them since the trade fair. Many customers are using them in prototypes as an opportunity to gain experience with them.

Festo demonstrated its capabilities with its Productivity Master machine at the fair. The product portfolio is constantly being expanded. There are additional tools for product identification, selection, ordering and after-sales service. With its [online consulting expertise](https://getdigitalnow.com/), the company offers its customers a wide range of tools in addition to the support provided by Festo sales engineers. ■



Web-Guide:

www.festo.com/group/en/cms/index.htm
<https://getdigitalnow.com/>

Enhanced performance: small servo drive system developed further

WITTENSTEIN CYBER MOTOR'S LATEST GENERATION OF ITS SMALL SERVO DRIVE SYSTEM FOR INDUSTRIAL APPLICATIONS OFFERS OUTSTANDING CONNECTIVITY, COMPACTNESS AND CONFIGURABILITY.



Based on enhanced technology platforms on the controller and motor sides, Wittenstein Cyber Motor has also designed a version with an integrated motor: the Cyber Dynamic system.

The small industrial servo drive system sets a new benchmark with its connectivity because the controllers (Cyber Simco Drive 2) are available with a multi-ethernet interface. This allows one and the same hardware to choose freely between Ethercat, Profinet and Ethernet/IP CIP Syn; it will be possible in future to use Sercos III as well and there will also be a version for use with CAN open. The drive controllers also impress with their compactness:

compared to the respective previous version, their size has been reduced by about 30 per cent. This has made it possible to create the motor-integrated Cyber Dynamic System (CDS) version too. The STO (Safe Torque

Off) function meets the safety requirements of SIL3 and PL e for all versions of the Cyber Simco Drive 2 and the CDS.

»Highly dynamic small servo motors from the Cyber Dynamic Line family and real-time-capable drive amplifiers of the Cyber Simco Drive 2 series constitute a comprehensive range of building blocks for small drive systems.«

André Henniger, Product Manager
at Wittenstein Cyber Motor GmbH

Together with the small servomotors from the Cyber Dynamic Line, which are torque and force tight, the new small servo drive system allows drive solutions to be configured that are probably the most compact of their type on the market. A high-quality and easy-to-clean standard stainless steel housing or a special corrosion-

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Multi-Ethernet interface, CIP-Sync real-time functionality, STO safety function and decentralised intelligence — the new small servo drive system from Wittenstein Cyber Motor fits perfectly into the field of smart machine concepts.

resistant stainless steel version is available for all four motor sizes from 17 mm to 40 mm outer diameter. The size 40 motors can be optionally equipped with a parking brake and can also be operated with an NP type low-backlash planetary gearhead of the Alpha Value line from Wittenstein Alpha. In addition, the optional integration of batteryless multiturn encoders enhances the functionality of the size 32 and size 40 motors. On the power side, torques of up to 22 Nm and forces of up to 2 kN can be achieved with the actuators.



Speeds of up to 1000 mm/s are possible at the same time, which is proof of the motors' high torque density and dynamics. Finally, suitable power supply units and preassembled connecting cables underline the small servo drive system's 'everything from a single source' approach. ■



Web-Guide:

www.wittenstein.de/en-en/

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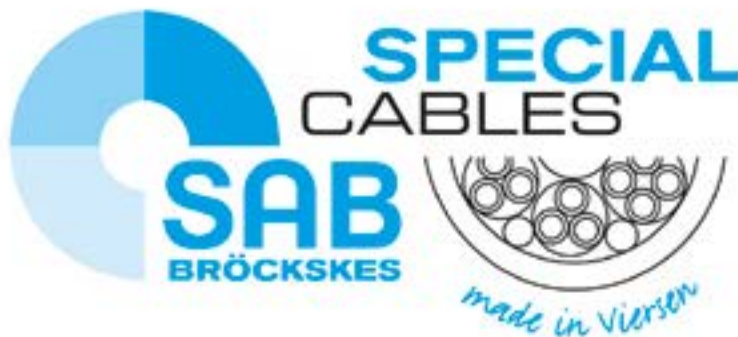
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The cable of the future

Erik Schäfer

IGUS PRESENTED ITS FIRST SINGLE PAIR ETHERNET (SPE) CABLE AT THE SPS. ERIK SCHÄFER SPOKE TO RAINER RÖSSEL, HEAD OF THE COMPANY'S CHAINFLEX CABLES BUSINESS UNIT.

Mr Rössel, Harting caused quite a stir at the SPS when it presented its standardised single pair ethernet connectors. Igus was also part of the SPE Industrial Partner Network right from the start. What actually happened?

Rainer Rössel: We were involved right from the start, so we were able to adopt a completely new approach to the interplay between connector, technology and cable. Connectors are becoming smaller and smaller, but it's difficult to insert the corresponding movement cables into them. Cables for fixed installations, which are thinner, are often not an alternative because as soon as they're subjected to continuous movement, they have to be made somewhat thicker due to the greater mechanical protection that's then required. Our approach in the SPE project was therefore to get involved in the development of the connector right from the start.

The aim of the close cooperation with Harting was to ensure the connectivity of our cables, but to ensure at the same time that the cables are also compatible with the housings into which suitable bushes are then fitted. With our cables for continuous movement, SPE thus allows us to offer our customers a universal product but with the necessary connectors and bushings as well.

Rainer Rössel: „The correct article description for our first single pair Ethernet cable family is CFBUS. PUR.042.“



Photos: Erik Schäfer

Single pair Ethernet cable from Igus (top) with standardised connectors from Harting (next page).



You decided to back Harting from a very early stage

...

Rainer Rössel: That always has something to do with relationships and the will to cooperate. We've been working together with Harting for a long time and very closely in various areas. There was great willingness to cooperate on both sides so then it just simply came about.

Your part is to develop suitable cables for the standardised SPE connectors. What makes SPE cables so special?

Rainer Rössel: Obviously we must ensure that we maintain the electrical properties. The particular feature here is mechanical stability in the respective application.

As part of the single pair Ethernet development we've now brought out a family of cables: [the CFBUS.PUR family](#). This is because we believe that the main area of application for SPE will initially be in machine tools. It's also the reason why we've chosen a PUR material for the outer jacket that's suitable for meeting the demands made on machine tools, such as oil and cooling lubricants. The key aspect here is focusing on the continuous movement of this cable.

Going back to the name of the SPE cable family...

Rainer Rössel: The correct article description is CFBUS.PUR.o42. CFBUS.PUR is the identifier for a PUR bus-cable family and .o42 is the designation for single pair Ethernet. The focus here is on the stranding: having the right strands

that also harmonise with the connectors. The damping must not be changed - hence the special shield construction, which is designed for continuous movement.

Mr Rössel, can you also tell us a little bit about the latest developments and milestones of the SPE Partner Network?

Rainer Rössel: Rainer Rössel: From our side, we're already marketing an SPE cable family. And we're ready to extend this further straightaway. This topic has been the subject of teasers, presentations have been made and it's been standardised; now we have to see how the market reacts. The advantage of the single pair Ethernet is that it's very cost-effective: you can build very small and you can use it to make sensors and actuators 'smart'. Although the interface and cables for a single pair Ethernet are currently on the market, end devices aren't available yet - this will be an exciting next step. ■

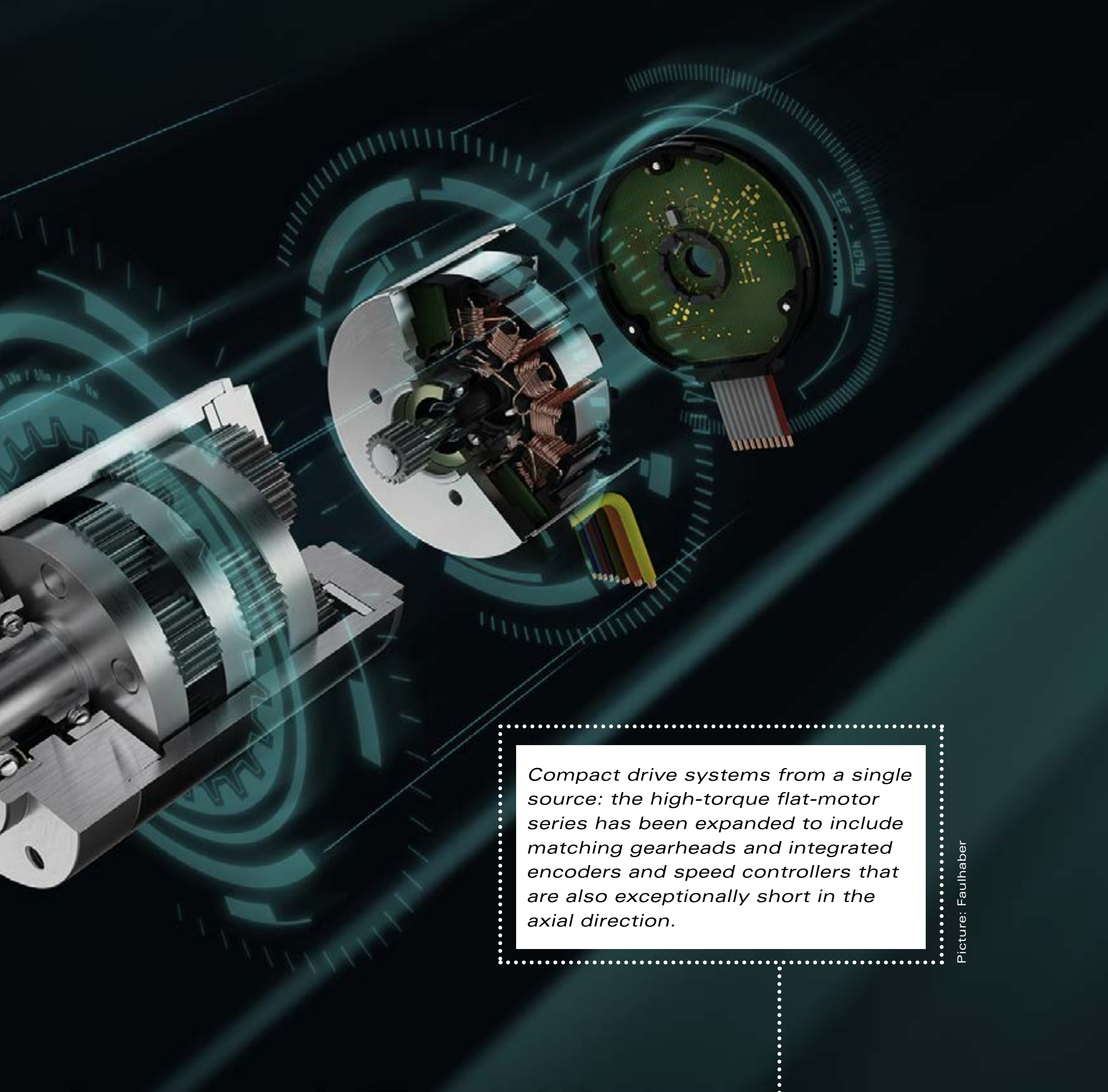


Drive systems: thinking ahead

THE GPT GEARHEAD WAS ONE OF FAULHABER'S HIGHLIGHTS AT SPS 2019. IT IS PART OF THE 'SUPER COMBINATION' COMPRISING MOTOR / GEAR / ENCODER AND SPEED CONTROLLER.



Faulhaber has extended its [BXT flat motor series](#) to include matching gearheads and integrated encoders as well as speed controllers that are also exceptionally short in the axial direction. All the components function perfectly together. Thanks to innovative winding technology and optimised design, the brushless DC servomotors (with a conventional external rotor design) have a diameter of 22 mm, 32 mm or 42 mm and generate torques of up to 134 mNm and a continuous output of up to 100 W with high efficiency! They operate at speeds of up to 10,000 min⁻¹ and are available with or without a housing, which further extends the range of applications.



Compact drive systems from a single source: the high-torque flat-motor series has been expanded to include matching gearheads and integrated encoders and speed controllers that are also exceptionally short in the axial direction.

Picture: Faulhaber

METAL PLANETARY GEARHEADS

The [metal GPT planetary gearhead series](#) is suitable for reducing the speed of the flat motors. The all-metal gearheads achieve performance values comparable to those of considerably more expensive technologies, such as those that use ceramic components. They are available with motor-compliant diameters and offer very finely graduated reduction ratios from 3:1 to 1294:1 in up to four stages. Depending on the diameter, the gearheads achieve continuous torques of 1, 8 or 18 Nm. Higher torques are also possible for short periods. Furthermore, the gearheads are very robust and can withstand both constant loads and rapid

load changes. The single-stage 22-mm version, for example, is only approx. 18 mm long and the four-stage version is approx. 37 mm long. The corresponding lengths for the 42-mm gearhead are just under 31 mm and approx. 68 mm respectively.

ENCODER IN HOUSING WITH HIGH POSITIONING ACCURACY

All BXT motors are equipped with digital Hall sensors and therefore the speed can be controlled precisely thanks to the high number of poles. The IEF3-4096 [magnetic encoder](#) is available for precise positioning applications. The encoder is fully integrated into the housed motor versions, whereby the entire drive is only 6.2 mm longer. It offers three channels with index function, a line driver and a high resolution up to 4,096 pulses per motor revolution.

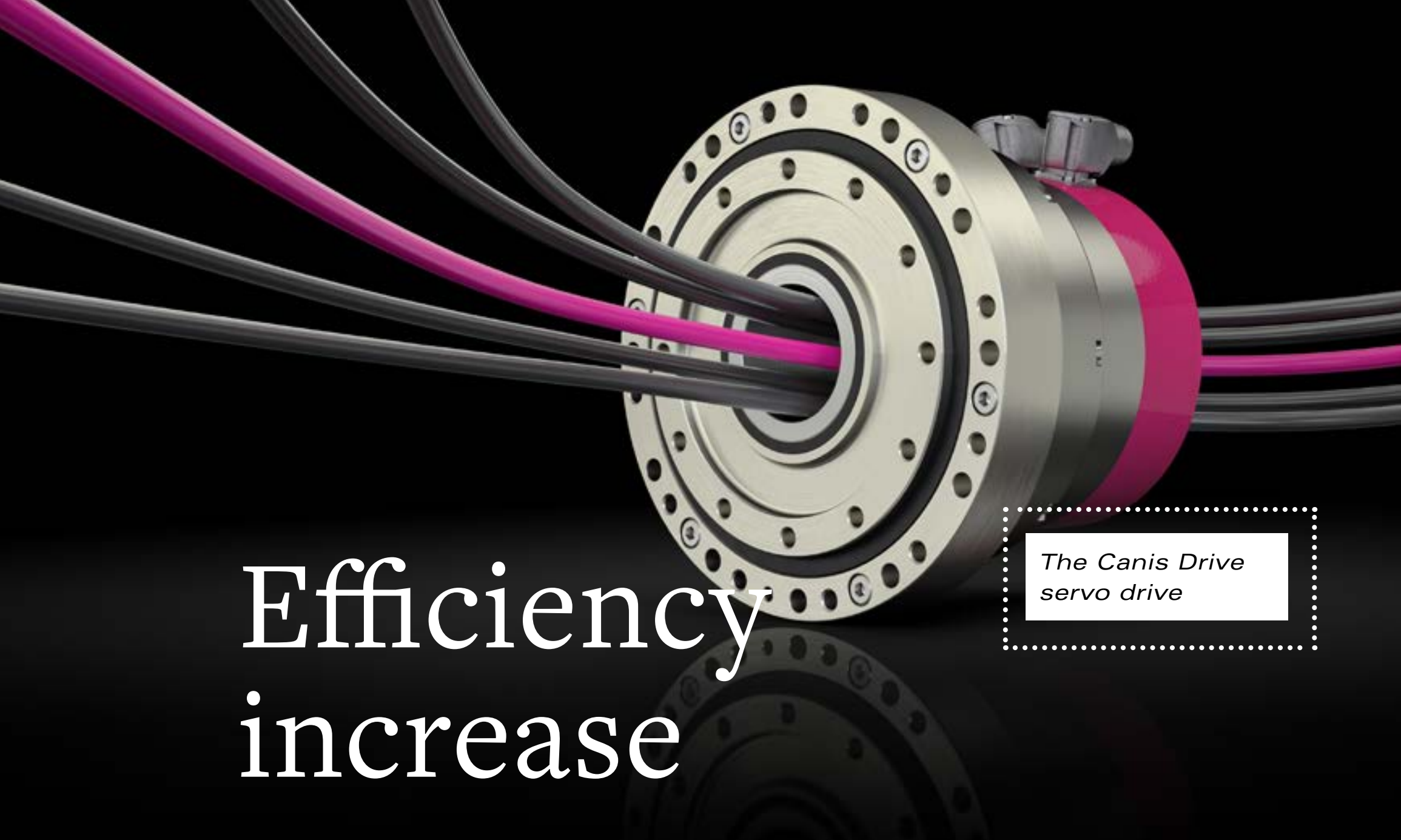
INTEGRATED SPEED CONTROLLERS COMPLEMENT THE PORTFOLIO

Speed controllers for BXT motors have also been available since April 2020. They are integrated into the housed versions of the BXT motors and only increase their length by 6.2 mm. Digital Hall sensors integrated in the motors are used for speed control. This means that a wide speed range from 200 min⁻¹ to 10,000 min⁻¹ is available. ■



Web-Guide:

www.faulhaber.com/en/home/



Efficiency increase

*The Canis Drive
servo drive*

Alois Buss

MORE COMPACT, MORE PRECISE AND MORE EFFICIENT - THE DEMANDS ON DRIVE TECHNOLOGY COMPONENTS ARE INCREASING, WHILE DIGITALITY IS BECOMING INDISPENSABLE. THE HARMONIC DRIVE SE TAKES UP THE CHALLENGE.

Sizes 50 and 58 from the Canis Drive series of servo drives were the focus of attention at SPS 2019. The requirements specified for drive technology have become more complex over the years and are demanding increasingly sustainable product development. In particular, core components such as drives must meet the growing demands of the various applications. The further development of the Canis Drive addressed these challenges and in the end combined power density, precision and robustness - and a large hollow shaft for optimal design flexibility.

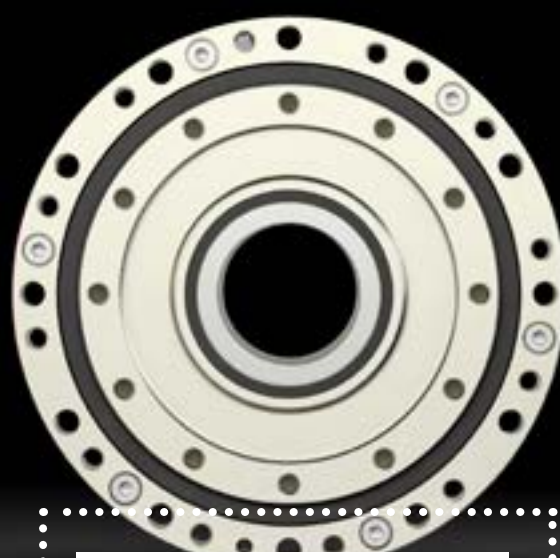
FOCUS ON DIGITISATION

As the hub for industrial automation, the SPS in Nuremberg brings together the relevant trade visitors from all over the

»The digitisation of production and in the field of automation and handling in particular necessitates that intelligence is integrated in mechatronic drive systems in a consecutive manner.«

world year after year. It therefore represents an excellent forum for high-precision drive technology like the [Canis Drive servo drive series](#) and offers an opportunity, as it did last year, for informative and in-depth discussions. However, it also makes it clear that technical achievements can lead to innovations that change entire markets. This is particularly evident in the field of manufacturing: The digitisation of handling and automation is indispensable to ensure that modern plants continue to increase their efficiency in the future.

Accordingly, servo drive technology has to create compact systems that at the same time combine precision, dynamics and performance in order to satisfy market requirements and ensure intelligent functions are integrated in a consecutive manner. Harmonic Drive SE is tackling this urgently required development - and is in the process of becoming the technological leader in high-precision mechatronic drive systems. ■

**Web-Guide:**www.harmonicdrive.de/en/home

*The servo drives
of the Canis Drive
series*



Photos: Harmonic Drive



Photo: Erik Schäfer

Sensational breakthrough

Erik Schäfer

SPS 2019: HARTING'S SINGLE PAIR ETHERNET CONNECTORS HAVE BEEN INTERNATIONALLY CERTIFIED/STANDARDISED REPORTS RALF KLEIN, MANAGING DIRECTOR OF HARTING ELECTRONICS.

Harting has managed to do it: the single pair Ethernet connector has now been standardised internationally. Which standards are involved?

Ralf Klein: In the case of the SPE connector, it is IEC 63171-6, which was published in January this year. ISO/IEC and TIA also make reference to this standard in their SPE cabling standards and IEEE802.3 also recommends IEC 63171-6 interfaces as media-dependent interfaces (MDI).



Photo: Harting

»The response
at SPS 2019
was really
overwhelming.«

Ralf Klein, Managing
Director of Harting
Electronics:

At the same time as this innovation was revealed you also announced the establishment of the SPE Industrial Partner Network. What's behind that? What's the job of the network?

Ralf Klein: The network brings together industry specialists from all major industrial sectors to establish a uniformly coordinated and standardised infrastructure for the single pair Ethernet. The network is intended to provide investment security and be the first point of contact for all interested parties who want to obtain information for their own start into IIoT using SPE.

The SPE Industrial Partner Network had seven founding members. Who are they and have more partners joined since then?

Ralf Klein: The founding companies were: Harting, TE Connectivity, Leoni, Murr Elektronik, Würth Electronic, Hirose and Softing IT Networks. By January 2020, the SPE Industrial Partner Network had already more than doubled in size and there are now nine new members on board. The trend is markedly upwards.

There was a fierce struggle for standardisation behind the scenes. What tipped the scales in favour of the Harting connector face?

Ralf Klein: Harting has always stood for standardisation because no matter how well-developed isolated solutions may be, users want to be able to rely on their infrastructure via end-to-end standardisation. This includes standards and verifiable basic data. In the case of the T1 SE interface, we were the first company to recognise the potential for automation at a very early stage, so we took the initiative and started the standardisation process for an SPE mating face in IEC SC48B. As a result, our proposal is now also the first to be published and in 2018 was chosen by ISO/IEC and TIA as the recommended interface for industrial SPE applications in an international voting procedure requested by IEEE 802.3. The ISO/IEC 11801 cabling standards also make

reference to the IEC 63171-6 interface as THE SPE interface for a standardised and verifiable end-to-end network connection in industrial automation.

What are the three striking benefits of the SPE connector over traditional Ethernet connectors?

Ralf Klein: Firstly, the T1 industrial interface (actually the entire SPE infrastructure) makes it possible for the first time to carry industrial Ethernet to the field level of the automation in a space-saving manner, at high data rates and over long distances. This is the real implementation of IIoT! Secondly, according to the transmission lengths in the IEEE 803.2cg standard for the process industry, transmission at 10 Mbit/s is possible for distances up to 1000 metres. ■

 **Web-Guide:**
www.harting.com

MAGAZINE LAYOUT



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gazines + Entertainment Magazines + Information Brochures
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VIDEO:
The Combi-Tac
Concept.

Photos: Stäubli

Interfaces for the smart factory

THE COMBI-TAC SYSTEM - APPLICATION-SPECIFIC INTERFACES FOR EFFICIENT MANUFACTURING 3.0 AND INDUSTRY 4.0.

Interfaces can be configured exactly to the specific requirements of an application thanks to the Combi-Tac modular connector system. This is of fundamental importance in the smart factory field, where time-saving, precision-adjusted systems are needed. [Mobile production modules](#), so-called smart cubes, which have predefined independent tasks in the production process, are often joined together to form a flexible production line within a very short time. This is where the Combi-Tac system from Stäubli comes into play. It offers ample tolerance compensation, a high number of mating cycles and the required combinations of power, data, signals and media.

SOLUTIONS FOR LOGISTICS 4.0

Automated guided vehicle systems (AGVs) transport material and workpieces from delivery via the warehouse to the production line. Ensuring the production process

runs smoothly necessitates, among other things, that loading of the AGV is carried out quickly so that downtimes are reduced to a minimum. Combi-Tac is used here as a compact interface in automatic battery changing systems or charging stations. Hybrid connectors can be configured for power, signals, data, temperatures, air and fluids. These combinations allow temperature monitoring during the charging process or control of the electrical connection and provide additional safety.

OPTIMISED FOR EACH APPLICATION

Stäubli has developed an optional [guide with high tolerance compensation](#) especially for AGVs that require sufficient compensation for alignment errors during automated docking. Combi-Tac is used as a fully tested system within transport systems with ready-made cable harnesses for [making contact with components](#) such as the control system, the motor or the inverter.

AWARD-WINNING CONFIGURATOR OPTIMISES DESIGN PROCESSES

The [Combi-Tac configurator](#) allows interfaces to be configured quickly and easily. The web application is user-friendly with realistic 3D animation including dimensioning; faulty combinations are automatically reduced to a minimum. Stäubli received the Automation App Award for the current version of the configurator at SPS 2019.

The Combi-Tac system is continuously being developed further so Stäubli will also be presenting new components at SPS 2020. ■



Combi-Tac as [battery connector](#) for manual connection



The hygienic monitor measures 16 inches across its diagonals.



VIDEO:
Machine Mounted Terminals
and Displays

Photos: Erik Schäfer

From prototype to series production

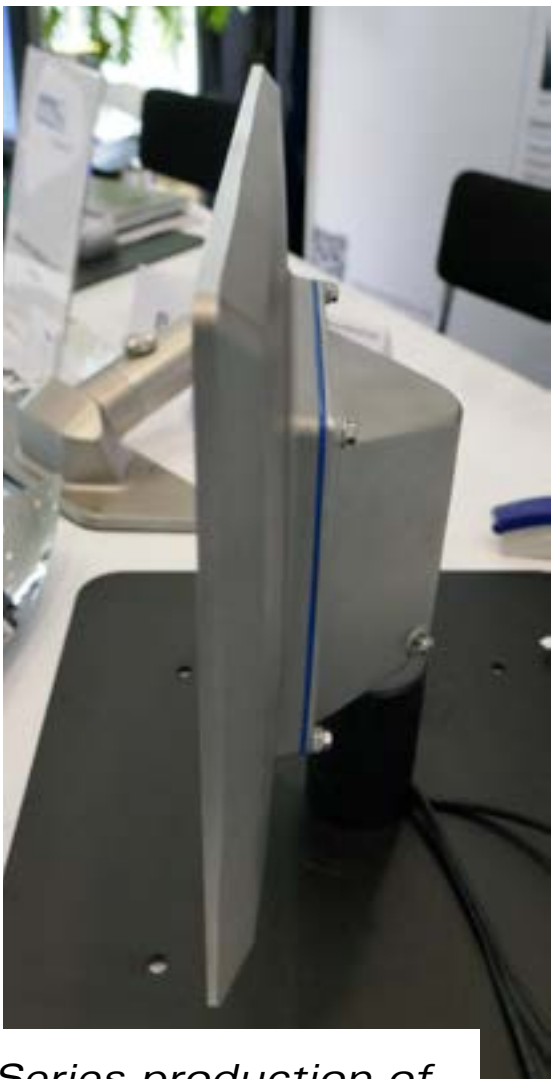
Erik Schäfer

ADS-TEC PRESENTED ITS MMD9016 HYGIENIC SCREEN FOR THE FIRST TIME AT THE SPS FAIR; IT WENT INTO SERIES PRODUCTION IN MAY.

Industrial PCs, [machine terminals](#), vehicle terminals and tablet PCs are the cornerstones of Nürtingen-based ADS-TEC's Industrial IT division. The group's second mainstay is ADS-Tec Energy, in which Bosch has a stake; this company is involved in the fields of highly efficient battery storage solutions and high-power fast charging systems for use in electromobility.

THE NEW HYGIENIC MONITOR

But let's get back to [ADS-Tec's Industrial IT division](#). The company had already presented its stainless steel monitor, the MMD9016, for the first time as a prototype at SPS 2019, but a lot has happened since then. The trade press days organised by RBS (Redaktionsbüro Stutensee) in Karlsruhe at the beginning of February this year was accompanied by a tabletop exhibition and ADS-TEC had a stand, where it presented a model of its MMD9016 that was then almost ready for series production. MMD stands for machine mounted display and the 16 at the end model number refers to the 16-inch (40.64 cm) screen diagonal. The monitor consists of a cast stainless steel housing and the built-in display has a touch function. The housing is glass-bead blasted to prevent bacteria etc. settling on the housing and make it is easy to clean. The new monitors will be used for machine and system operation in environments in the pharmaceutical, food, beverage and chemical industries with high hygiene requirements.



Series production of the MMD9016 was launched in May.



Web-Guide:
www.ads-tec.de/en/

PROFIWISSEN

FÜR ENTSCHEIDER

SCHNEIDBERENNEN
METALL
MECHATRONIK
INNOVATIONEN

LASERZELLE
MONTAGE
SPEZIALWERKZEUG
RATIONALISIERUNG
ROBOTER
KONSTRUKTION
MASCHINENBAU
SPANGEBENDE
METALLBEARBEITUNG
TRANSPORT
BILDVERARBEITUNG
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TRANSPORTSYSTEME
LASERSCHNEIDEN
ANLAGENBAU
ELEKTROTECHNIK
FAHRZEUGBAU
AUTOMATION
ENTWICKLUNG
STEUERUNG
WERKSTÜCKTRÄGER
3D-SCHWEISSEN
PROZESSSICHERHEIT
PRODUKTIVITÄT
SCHMIEREN
MESSTECHNIK
MATERIALFLUSSLÖSUNGEN
REINIGEN

Werkzeuge
Qualität
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VIDEO:
Discover the S-Line range for
customer-specific solutions.

*The new
product line
from Rose
Systemtechnik*

Complete HMI solutions

**AT SPS 2019 ROSE SYSTEMTECHNIK EXHIBITED
JOINTLY WITH CRE RÖSLER ELECTRONIC
FOR THE FIRST TIME AS A COMPLETE
SUPPLIER OF READY-TO-INSTALL SYSTEM
SOLUTIONS CONSISTING OF CONTROL
HOUSING, INDUSTRIAL PC AND SUPPORT ARM
STRUCTURE.**

.....
The takeover of the automation specialist was a further logical step for Rose on going from a component supplier to a system provider. “CRE is now fully integrated into Rose’s corporate structure,” says Dr Heinz Werner Rixen, Managing Director of Rose Systemtechnik. “The competen-

ces and resources of both companies have been reorganised into two business units: HMI Mechanics and HMI Creations.” HMI Mechanics covers the production of housings, housing components and support arm systems, while HMI Creations deals with industrial monitors, embedded PCs and panel PCs.

MAJOR ORDER FROM SCHULER

The successful cooperation between the two new divisions has already been demonstrated in a major order received from Schuler AG. In the course of modernising and standardising the machine design of its press systems, the press manufacturer was looking for a housing specialist who would be able to redesign the operating panels. Rose Systemtechnik has been successfully supplying Schuler with operating housings and support arm systems for almost 30 years and is also the only housing manufacturer on the market capable of integrating the e-paper technology into operating panels so the decision was quickly made in its favour.

Rose Systemtechnik is using changeable display lettering for the first time for the redesign of the Schuler presses and was the only company capable of meeting all the requirements of the press manufacturer’s specifications for the panels. In addition to the flexible e-paper technology, the new operating units also include a touch panel and an RFID chip for the operator to log into the system. Schuler is now successively equipping its presses with these innovative HMI panels. The first 22-inch panels have already been delivered. ■

Operating units with flexible e-paper technology, touch panel and RFID chip for operator login to the system



Photos: Rose Systemtechnik



Web-Guide:

www.rose-systemtechnik.com/en/



Photos: Balluff

Easy Tool-ID from Balluff now in version 2.0

Dr. Detlef Zienert

TOOL IDENTIFICATION USING BALLUFF INDUSTRIAL RFID INCREASES PRODUCTION EFFICIENCY, AS IT MAKES INCORRECT TOOL ALLOCATION OR MISSING TOOLS A THING OF THE PAST. THIS ENABLES OPTIMIZING THE SERVICE TIME UTILIZATION OF THE TOOLS. IN ADDITION, SCRAP AND REWORK DUE TO EXCESSIVE USE OF TOOLS ARE VIRTUALLY ELIMINATED.

With Easy Tool-ID, Balluff has provided an affordable entry-level solution into tool management earlier [Version 2.0](#) has now been newly released on the market. Just like the previous version, it is convenient to upgrade and is characterized by being easy to install and configure. It features an additional touchscreen display and offers the user even greater convenience in practical operation as well as during configuration via web browser without intervention into the machine tool.

All this is required is a USB port (keyboard expander) on the machine tool and a presetter. The data is written via RFID technology from the presetter to the tool and then passed on through the [Easy Tool-ID](#) system to the machine tool. As a result, error-prone manual entries are eliminated. On the new 7" touchscreen display, all tool data is now displayed to the user in plain text. This ensures the correct overview. With Easy Tool-ID, the risk of data



VIDEO:
Easy Tool-ID 2.0 supports machine operators by securely and quickly getting tool data to the machine tool.



entry errors as well as set-up times are thereby significantly reduced. Alongside the new controller with touch display, the system consists of a tool stand with integrated read/write head, a processor unit and the power supply.

Version 2.0 has been equipped with a controller with touch display.



The solution's handling and functional principle could not be easier: At the tool presetter, each tool is measured and its data, such as diameter and radius, are written on the data carrier on the tool shank. The user brings the tool to the machine, loads it into the tool holder and presses a button. The system then emulates the key input and automatically reads the data with the Balluff Tool-ID through the keyboard interface to the machine controller. Manual, error-prone entry is thus eliminated. This means that even existing machines can be modernized and upgraded with a cost-effective tool ID solution. ■



Web-Guide:
www.balluff.com



Photo: Sick AG

Making the sensors of a machine transparent – with Sick's Installed Base Manager app.

Sick simplifies digitisation of sensors

Matthias Elbert

**MORE TRANSPARENCY MEANS
GREATER PLANT AVAILABILITY
AND HIGHER PRODUCTIVITY:
SICK'S INSTALLED BASE MANAGER
APP DIGITISES A MACHINE'S
WORLD OF SENSORS.**

Quickly finding, identifying and analysing sensors in the event of a fault is a prerequisite for minimising machine downtimes. By using the [Installed Base Manager app](#) from Sick, machine operators can now create a digital, hierarchical and duplication-free display of their assets themselves – and access them directly in case of an emergency. It enables machines and the sensors installed in them to be digitised quickly and easily, including their serial numbers, installation locations and photos. Users can obtain information about their sensors, machines and systems in a simple manner even if several authorised persons are working simultaneously with the app, which is always readily at hand via a smartphone.

CLEAR PRESENTATION, HIGH UTILITY VALUE

The app, which is available for Android and iOS, gives the user a clear presentation of all relevant product informa-

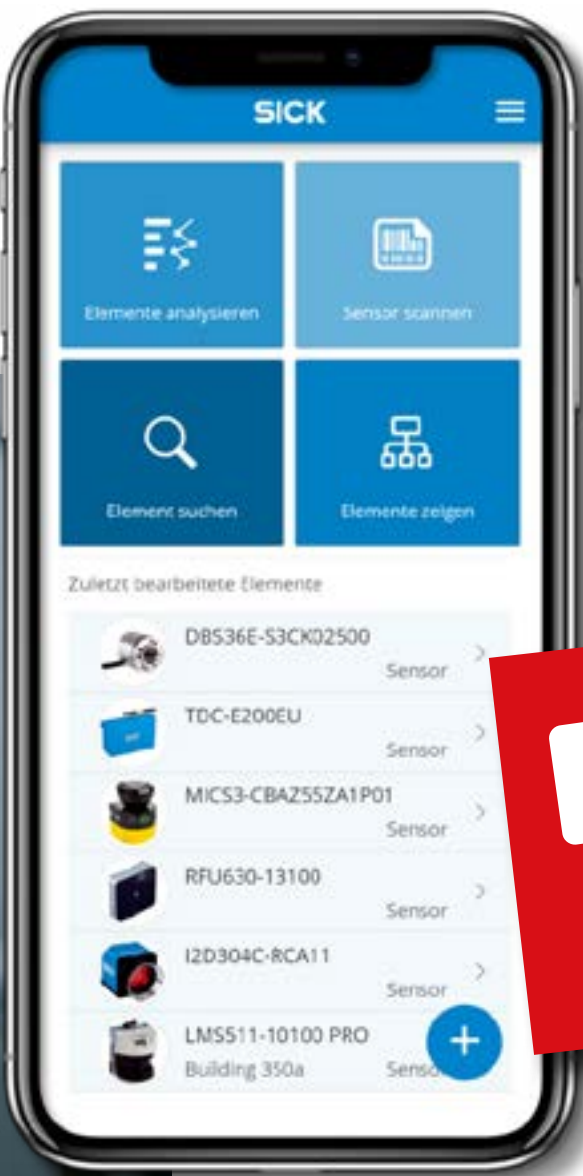
In the picture locally – Sick's Installed Base Manager app guides the operator through the world of sensors in his machine.



tion regarding his assets and, in combination with the Sick Asset Hub software tool, it can plan, control and monitor maintenance and servicing. Furthermore, relevant documents, such as operating instructions, inspection reports, test reports, calibration certificates or the product lifecycle status of the products covered can be made available online.

Among other things, users praise the transparent listing and simple management of Sick and third-party sensors, as well as the possibility to scan sensors directly on the machine. The digital service that allows direct re-ordering of damaged sensors, or of follow-up products in the case of discontinued lines, is also rated highly.

Using the Installed Base Manager app, Sick offers a new level of information transparency as a basis for Industry 4.0 applications. ■



VIDEO:
To the video: Alexandra Schindler, Sales Specialist Smart Data Solutions, explains how the digitisation of sensors using Sick's app works.

»With the Installed Base Manager app we want to make it easy for machine operators to bring more transparency to their world of sensors and assets.«

Matthias Elbert,
Vice President Smart Data Solutions
at Sick AG.

Web-Guide:
www.sick.com/de/en/



Bild: Micro-Epsilon

For measurements on difficult surfaces, blue laser technology can be used in addition to the standard red laser.

Red, blue - highly accurate

MICRO-EPSILON PRESENTED ITS HIGH PERFORMANCE LASER SCANNERS AT SPS 2019. HERE IS AN OVERVIEW.

The Scancontrol 30xx series of laser profile scanners from Micro-Epsilon provide high-precision results even on demanding surfaces and are used for dynamic 2D/3D profile measurements in automation, production and process monitoring as well as in quality control. With around 5.5 million points per second and up to 2048 measuring

points per profile, they provide highly accurate results and calibrated profile data. They are available with a measuring range of 25 mm or 50 mm.

IN HIGH DYNAMIC RANGE MODE FOR HIGH PRECISION

On inhomogeneous and dark surfaces, the [Scancontrol 30xx laser scanners](#) deliver extremely precise results via a combination of the high dynamic range mode and improved auto exposure. As the different exposures are carried out simultaneously, even moving objects are detected reliably.

MEASUREMENT VALUE OUTPUT VIA GATEWAY AND BLUE LASER TECHNOLOGY

It is possible to transfer the measurements via the Scancontrol gateway using various interfaces such as Ethernet, Profinet, Ethernet/IP or Ethercat. For measurements on demanding surfaces, blue laser technology can also be used in addition to the standard red laser. Here, Micro-Epsilon holds the patent for measurements with blue lasers on red-hot objects above 700 °C and (semi-) transparent objects.

Transparent objects include plastics, glass, adhesives, silicone, paints, coatings, Plexiglas and sealants. Blue laser scanners offer advantages over sensors with red laser diodes in many measurement applications. On incandescent organic materials or semi-transparent objects, the blue laser line is displayed sharply and this generates stable and precise results. ■



Quickly retrofitted: the QM30 vibration and temperature sensor is simply mounted on the motor using a magnet and transmits data to a radio module.



VIDEO:
This is what condition monitoring is all about - Turck explains the most important systems in detail.

Photos: Turck

Condition monitoring for existing plants

Dr. Bernhard Grimm

EVEN EXISTING SYSTEMS CAN BE MADE FIT FOR CONDITION MONITORING IN NO TIME AT ALL USING SMART SENSOR TECHNOLOGY AND FLEXIBLE SOLUTIONS FOR THE TRANSMISSION AND VISUALISATION OF DATA.

With its [condition monitoring solutions](#), Turck offers a complete box of tricks - from robust sensors for use in the machine environment to visualisation via a smartphone. Using motor monitoring as an example makes it clear that there is no need for complex adaptation, especially in

existing plants. When mounted directly on the motor, for instance, the QM30 vibration and temperature sensor provides measurement data that can be sent to an HMI via cable or encrypted to mobile devices via Turck's TCG20 Cloud Gateway.

MOTOR MONITORING AS A RETROFIT

Irregularities in a motor often manifest themselves through changes in the frequency of vibration. To detect these changes, maintenance personnel can attach a QM30 vibration and temperature sensor directly onto the motor. The compact IP67 sensor is mounted simply using a magnet. It provides data on speed and acceleration and outputs a temperature measurement, in other words it registers whether the motor is at a temperature between -40 and +105 °C. Increased current consumption by the motor can also indicate imminent problems.

Measurements can be transmitted by cable or wireless. Often, a decentralised alarm system already fulfils the requirements, for example one consisting of the QM30VT2 sensor and Turck's TBEN-S2-2COM I/O module. Thanks to the integrated intelligence provided by the ARGEE programming environment, the fieldbus module takes over the PLC functions if required and transmits information about a threshold value that has been exceeded directly to an indicator lamp or an HMI. Wireless transmission, which can also be battery-operated if required, offers even more flexibility.

If required, the data from the machine can be transmitted wirelessly to the Turck Cloud via a mobile phone or WLAN, which can be hosted without an Internet connection as a private cloud in the company's own data processing centre. In this way, information can be called up on any connected end device, such as a smartphone or tablet, and linked to alerts via SMS or e-mail. ■



The user has a complete view of everything, either directly on site on a TX700 HMI/PLC or via a cloud solution on mobile end devices.





*4i Edge X security gateway with
Docker container technology*

Trends in IIoT: edge, cloud and container technology

Raphael Vallazza

DATA PROCESSING IN IIOT IS RELYING INCREASINGLY ON A MIX OF EDGE COMPUTING, CLOUD COMPUTING AND CONTAINER TECHNOLOGIES. AT THE SAME TIME, IT SECURITY IS OF FUNDAMENTAL IMPORTANCE FOR DATA-BASED BUSINESS MODELS.

The [Endian 4i Edge X](#) is an innovative security gateway for IIoT and supports the current trends in the [Industry 4.0 environment](#). The increasing degree of networking creates ever larger amounts of data, which companies want to evaluate and use for innovative business models. Instead of transferring all the data to a central [IoT platform](#) in the cloud, more and more often a pre-evaluation takes place at the place where the data is created. This principle is called edge computing and it saves computing capacity and costs. It also enables real-time analysis to be carried



out because the latency caused by technical factors during transmission via the internet is eliminated. The Endian 4i Edge X has high computing capacity and a powerful processor for data processing at the edge of the network.

Against this background, it makes sense to move a company's applications to the edge of the network as well. Container technologies, such as Docker, are particularly suitable for this purpose: applications can be packed into a portable and highly available system. A software container is independent of an operating system and consists of several layers. Depending on the host environment, each element reloads the components that it needs in order to run. This allows software containers to be used



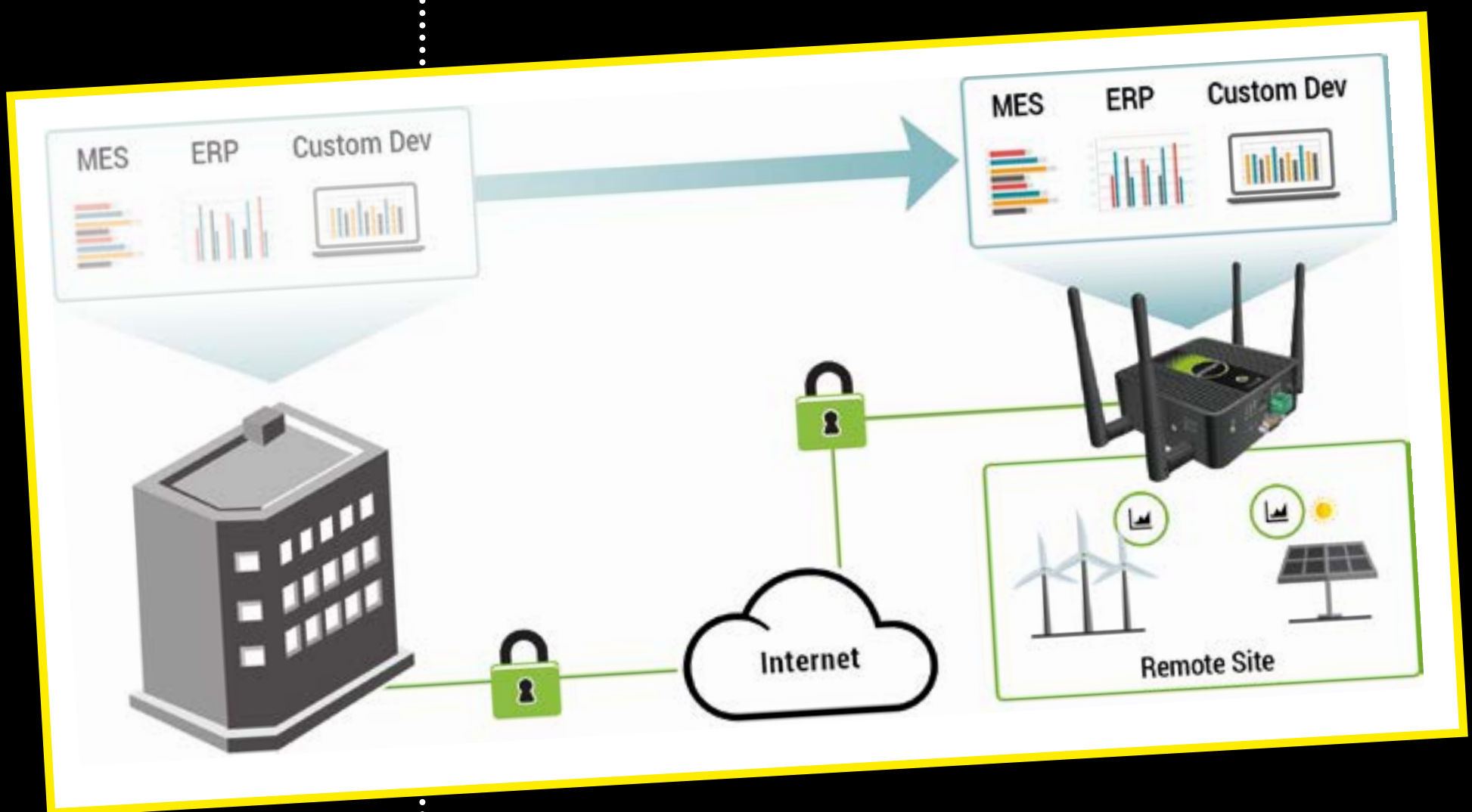
*Raphael Vallazza,
Endian's CEO*

Edge computing is becoming increasingly important in IIoT. This means that the secure and simple distribution of applications also plays a central role. Docker and the 'Endian 4i Edge X gateway support this strategy.

in a wide variety of environments. Docker is therefore pre-installed on the Endian 4i Edge X.

Data-based business models presuppose that the data used are absolutely correct. To protect data from theft and manipulation, the Endian 4i Edge X is equipped with several security features, such as a firewall, anti-virus software and an Intrusion Detection System (IDS). The software is kept up to date at all times via the central management. A VPN is used to encrypt the data during transmission to the central IoT platform. ■

>> Web-Guide:
www.endian.com



Photos: Endian

Container technologies bring business applications to the edge of the network

Packaging line simulated using
Industrial Physics



VIDEO: Planning intralogistic
systems with maximum utiliza-
tion through a 3D simulation.

Virtual commissioning

Dr. Georg Wunsch

**VIRTUAL COMMISSIONING REVEALS
UNUSED POTENTIAL IN ALMOST
ALL AREAS OF A COMPANY.
MACHINEERING HAS
CALCULATED THE POTENTIAL
SAVINGS.**

Virtual commissioning made a convincing case with verifiable savings in the areas of productivity, quality and time. The customer saved a total of 2.5 million euros annually across all business units.

Nowadays virtual commissioning should be a standard part of any development process. The benefits are obvious: errors are detected at an early stage, delivery times are shortened and there is an improvement in the quality of the machines delivered. But Machineering's capital expenditure calculation presented at SPS 2019 showed that virtual commissioning has a positive effect on many areas of a company.

RECOGNISE AND MAKE USE OF SAVINGS POTENTIAL

Using an example from a customer, the company's simulation experts used real figures to demonstrate the actual savings potential that can be achieved through the optimal use of virtual commissioning. To do this, the figures from before and after carrying out virtual commissioning were compared using the Industrial Physics simulation software. Virtual commissioning made a convincing case with verifiable savings in the areas of productivity, quality and time in all fields of development. The customer – a manufacturer of special-purpose machines with an average annual turnover of 140 million euros and 700 employees – saved a total of 2.5 million euros annually across all business units.

The calculation of the overall capital expenditure shows that the relatively low cost of virtual commissioning is offset by a significant increase in efficiency in many areas of the company. With a savings potential of around 1.7 million euros, the costs for the initial investment are already amortised after three months.

THERE IS STILL A GREAT DEAL OF INTEREST

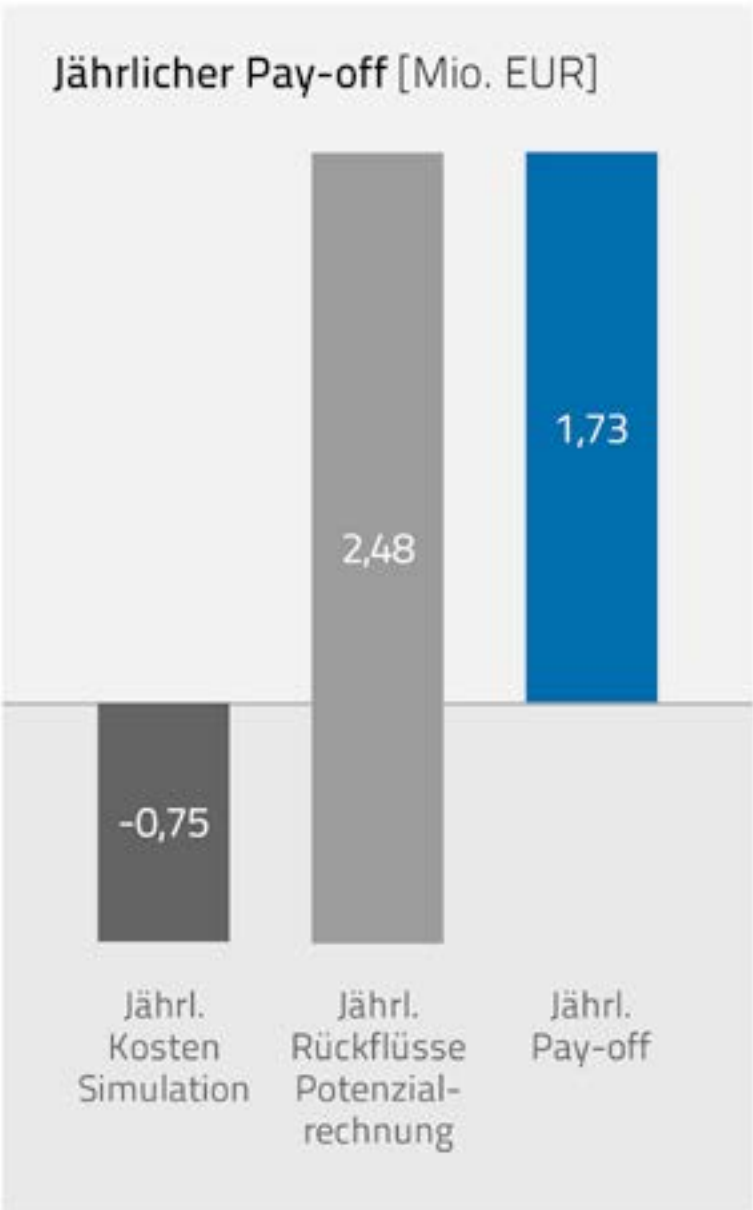
More and more companies are now working with Industrial Physics because the software is always state-of-the-art. It was the capital investment calculation presented at

SPS 2019 that generated a lot of interest among many of these customers, as well as other prospective customers. Numerous companies have already had their individual savings potential determined by Machineering's team of experts.

It has been known for a long time that virtual commissioning is worthwhile for R&D. At last, the financial potential is now becoming apparent as well. ■

>> Web-Guide:
www.machineering.de/en/

Comparison of investment costs (personnel, software and hardware) and annual savings, together with amortisation of the investment



Photos: Machineering

Wide range of SPE cables

SINGLE-PAIR ETHERNET CABLES FOR USE IN CABLE CARRIERS AND ROBOTS

The increasing networking and communication of system components means ever larger amounts of data must be transmitted reliably, even under the most difficult conditions. With Industry 4.0, the requirements for real-time data transmission and the rapidly increasing degree of networking in production are growing at a fast pace.

Ethernet cables in industrial applications are very often exposed to high mechanical loads and/or high temperatures and come into contact with various chemicals, oils and cleaning agents. SAB Bröckskes quickly recognised these requirements and the need for industrial users to have the universal Ethernet (IIoT) right down to the smallest production level, including sensors and actuators, and thus developed robust and economical solutions at an early stage. SAB Bröckskes now offers solutions for various areas of application with its





CAT-Line SPE C Track Robot, the SPE cable with UL mark that is suitable for use with robots.

new CAT-Line series of SPE cables.

The focus here is on two single-pair Ethernet cables that have

been specially developed for the increasingly high data transmission rates used in automation. In

addition to the CAT-Line C-Track, a single

pair Ethernet cable with cable-carrier ca-

pability, SAB Bröckskes has also developed a ro-

bot-compatible SPE cable with UL recognition:

CAT-Line SPE Robot. With

a bandwidth from 1 to 600

MHz, the cable-carrier or robot

compatible SPE cables ensure safe

and reliable data transmission. These

cables are also non-critical with regard to

substances that inhibit lacquer wetting and are

oil-resistant, UL-approved and RoHS-compliant.

WIDE RANGE OF SPE CABLES

Depending on customer requirements and the field of application, the following single-pair Ethernet cables are available:

CAT-Line SPE C-Track is a cable-carrier-compatible SPE cable.

SAB BRÖCKSKES · D-VIERSEN · CATLine SPE C-Track 2xAWG26/7 1777-1630



The CAT-Line SPE C-Track is suitable for use in cable carriers under harsh industrial conditions.

- **CAT-Line SPE C-Track** – a cable-carrier-compatible single-pair Ethernet cable with UL recognition (the CAT-Line SPE C-Track is suitable for use in cable carriers under **the harsh industrial conditions pertaining in automation**).
- **CAT-Line SPE Robot** – a single-pair Ethernet cable with UL recognition suitable for use on robots (the CAT-Line SPE Robot is suitable for use under the harsh industrial conditions encountered by robots).
- **CAT-Line SPE HT** – a high-temperature-resistant single-pair Ethernet cable with UL recognition (the CAT-Line SPE HT cable is suitable for use under harsh, industrial conditions at temperatures up to +180°C)
- **CAT-Line SPE Rugged** – a rugged single-pair Ethernet cable for indoor and outdoor use.

THE ECOSYSTEM IS IN PLACE

A T1 SPE C-Track cable must meet the electrical and transmission requirements of CD IEC 61156-12 Ed. 1.0. Connectors are available, for example from Harting, with whom SAB Bröckskes works closely. According to the current status, SPE does not require more bandwidth than Cat 7A.

Cables from SAB have already been tested successfully. SAB's production options cover not only the basic types and standard dimensions, but in particular special cables, which are designed according to the respective customer requirements. The production can also be carried out in small lot sizes, which are interesting for small and pilot series. ■



Web-Guide:

www.sab-worldwide.com



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Predictive maintenance for cables

**AN INNOVATIVE SOLUTION FROM LAPP
ALLOWS CABLE MAINTENANCE TO BE
PREDICTED WITHOUT THE NEED TO
MAKE ANY CHANGES TO THE CABLE.**

Usually, whenever Industry 4.0 is mentioned the term predictive maintenance soon crops up. Solutions for connection systems are already available but they are not particularly appealing. Either they require special cables with a sacrificial wire or two boxes that must be docked at the beginning and end of the line. A new solution from Lapp is much more practical. In developing this technology, the company started with cables for industrial data communication. The aim was to predict the optimum point in time to replace an



VIDEO: Lapp's Predictive Maintenance Box is being further developed and refined at the company's in-house test centre.



Photos: Lapp

The Etherline Torsion Cat. 7 is a high-speed cable for industrial Ethernet applications



Ethernet line. The next step will be to monitor current-carrying lines as well.

LAPP PREDICTIVE INDICATOR

The new technology from Lapp does not require any changes to the line structure. Prediction is based solely on a protocol and a special algorithm. This also makes it possible to retrofit existing systems. Measurement and evaluation are carried out in a so-called [PMBX \(Predictive Maintenance Box\)](#). This box is inserted into the Ethernet line and monitors the line section between the application and the PMBX. Data packets run from an Ethernet port to the other port without any perceptible delay. The PMBX is invisible to a connected PLC and it has no influence on the data transmission. Evaluation of the data then generates a so-called Lapp Predictive Indicator, which is a mixture of transmission-relevant parameters.

For its energy chain cables, Lapp collected measurement data at its in-house test centre using the big-data approach and analysed them using mathematical algorithms. The resulting parameters are combined with the client's data in the PMBX during operation to calculate the Lapp Predictive Indicator; the greater the amount of data, the more accurate the prediction. In this way, the indicator makes it easier to plan the appropriate point in time for replacement.

Lapp presented its new technology to its clients at the SPS trade fair last autumn. Currently, the first implementations are taking place with pilot clients. ■

Currently, the first implementations are taking place with pilot clients.



Web-Guide:

www.lappkabel.com

Programming simply reliable

GRAPHIC USER INTERFACE FOR PROFESSIONAL CONTROL REDUCES IMPLEMENTATION TIMES

Microcontrol has been supplying its μ MIC.200 compact controller with Node-RED open source software since SPS 2019. This powerful DIN rail solution thus permits programming to be carried out simply and intuitively. The first pilot projects have been launched in the meantime.

[Node-RED](#) – developed by IBM – is now being managed by an independent user organisation and is used, for example, in combination with Raspberry Pi and other single-board computers. Node-RED is a browser-based flowchart programming software that consists of pre-programmed function blocks, the so-called nodes. The integration of Node-RED into Microcontrol's [μMIC.200 controller](#) makes it suitable for industrial applications for the first time.

Microcontrol's managing director Frank Wielpütz says: "The response at the SPS was very positive because many people are familiar with Node-RED from the home automation sector. Since the fair last autumn, we have prepared various I/O modules for Node-RED, which the user can incorporate into a logical context on the screen using a mouse. Due to the great demand, we are currently implementing additional function modules from our portfolio, for example for our box family."

Compared to the programming with C/C++ used so far, this solution offers users benefits such as an intuitive graphical user interface, simple and fast connection to IoT cloud services / Industry 4.0, results that can be used immediately and

Microcontrol's managing director Frank Wielpütz is enthusiastic about the response to the implementation of Node-RED: "We are working hard to expand our Node-RED library, at the moment for our I/O box family, for example."

MicroControl
Automatisierung

»We are working hard to expand our Node-RED library, at the moment for our I/O box family, for example.«

Frank Wielpütz,
Microcontrol-
managing director

the direct use of the controller without the need for additional local software installations.

“The use of Node-RED in combination with our μ MIC.200 leads quickly and easily to a controller that is suitable for industrial applications and offers an attractive price-performance ratio,” says Frank Wielpütz. There is also demand the other way round, though: “Thanks to the easy programming, customers can also use our professional controller at home – as an alternative to low-cost tinkering.”

Mr. Wielpütz also reveals information regarding projects: “We have customers who automate processes on test benches and, thanks to Node-RED, can react very quickly to the wishes of their colleagues or changing requirements without having to invest in a lot of programming.” He mentions two other ongoing projects: “One client is using our system to test new features in construction equipment and collect measurement data on a cloud server. Another is currently optimising its production by connecting production islands in terms of data via the μ MIC.200.”

Of course, the μ MIC.200 can still be programmed in C/C++ for particularly demanding specifications. “The integration of libraries and applications created in C/C++ into Node-RED is easy to implement at any time,” adds Frank Wielpütz reassuringly.

The μ MIC.200 impresses across the board with its robustness in a metal housing for TS35 DIN rail mounting, thermal stability from -40 to +85°C, battery-free memory (FRAM), its buffered real-time clock and its optimised real-time Linux operating system (Ubuntu LTS). ■



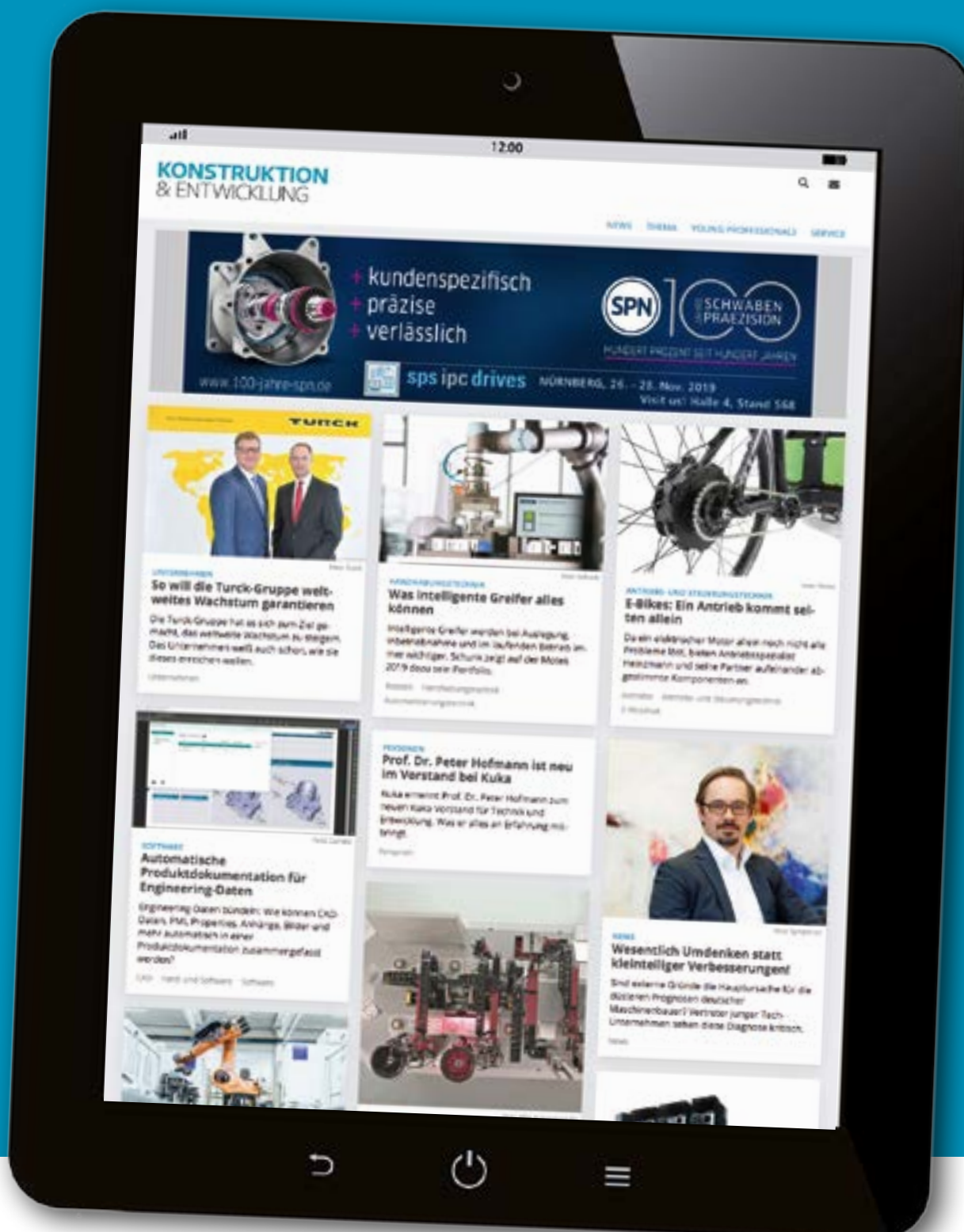
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THE CRISIS AS AN OPPORTUNITY

The only way to free oneself from crises is not to block them out but to deal with them. Every crisis also offers an opportunity. The Japanese have coined a term for this: *kaizen*. It is composed of *kai* meaning 'transformation or change' and *zen* meaning 'for the better'. It means the permanent improvement of tasks, procedures, processes or products by all the employees in a company. You, dear Readers of SPS Compact are currently holding such an opportunity, such a product in your hands.

We hope you enjoy reading this issue.

Judith Mörz, project responsibility SPS compact