The Magazine for Customers of the Turck Group Issue 2 | 2018

more@TURCK

Multitool for Industry 4.0

Q300 UHF reader guarantees reliable RFID applications – with a two-Watt output, RFID U interface, Ethernet with PoE and external antennas

Precise Measurement

The new generation of linear position sensors offers a 5 kHz sampling rate, shock resistance up to 200 g and a measuring length up to 2 m

Skilful Control

RobMation fits its cooling lubricant system for CNC machines with Turck's Codesys HMI/PLC and decentralized I/O systems

Sounds Good

With a further 22 new types, Turck's portfolio of ultrasonic sensors now offers a solution for virtually every application

»Smart Automation«

This year is the first time that "Smart and Digital Automation" will be the new theme of the SPS IPC Drives fair. With this and an additional hall for IT exhibitors, the fair is therefore meeting the needs of a trend that has been developing over several years: the merging of IT and automation technology. The Internet of Things and Industry 4.0 are becoming increasingly more of a reality.

These developments have also been ongoing at Turck. Our solutions for capturing, conditioning and transferring data enable us to supply Industry 4.0 with its vital elixir. The software share in our products has been constantly growing over years, and the Turck Cloud Solutions presented this summer is the first of our products that cannot be photographed.

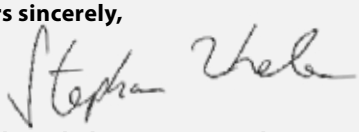
The TCG20 IoT Cloud gateways now provide the next step and simplify the connection of automation systems to Turck Cloud Solutions with a wireless gateway for Wi-Fi and LTE. These immediately provide you with entirely new options for making even very remote sections of a plant fit for the growing requirements of databased automation and predictive maintenance.

New developments for our products often give prime importance to many industrial interfaces and open standards. You will find considerable proof of this by taking a look inside this issue of your more@TURCK customer magazine. Starting with the IoT wireless gateways to our new TX700 HMI/PLC series, which is also ideal for retrofit projects, right through to a fair highlight, the Q300 UHF RFID read/write head. This reader removes the previous limits to identification and is in our view another multitool for Industry 4.0. You can find out more about this in our title story on page 10.

As sensor specialists, we are naturally also showcasing at the fair solutions from this area for smart automation, two of which we present in more detail in this magazine: the new, extremely robust generation of our linear position sensors with a measuring length of up to two meters and the large portfolio of ultrasonic sensors, in which you should be able to find the right device for virtually any application.

If we have been able to attract your interest, visit us in Nuremberg at stand 250 in Hall 7 or contact your Turck sales specialists. Looking forward to meeting you!

Yours sincerely,



Stephan Thelen, Director Sales Germany

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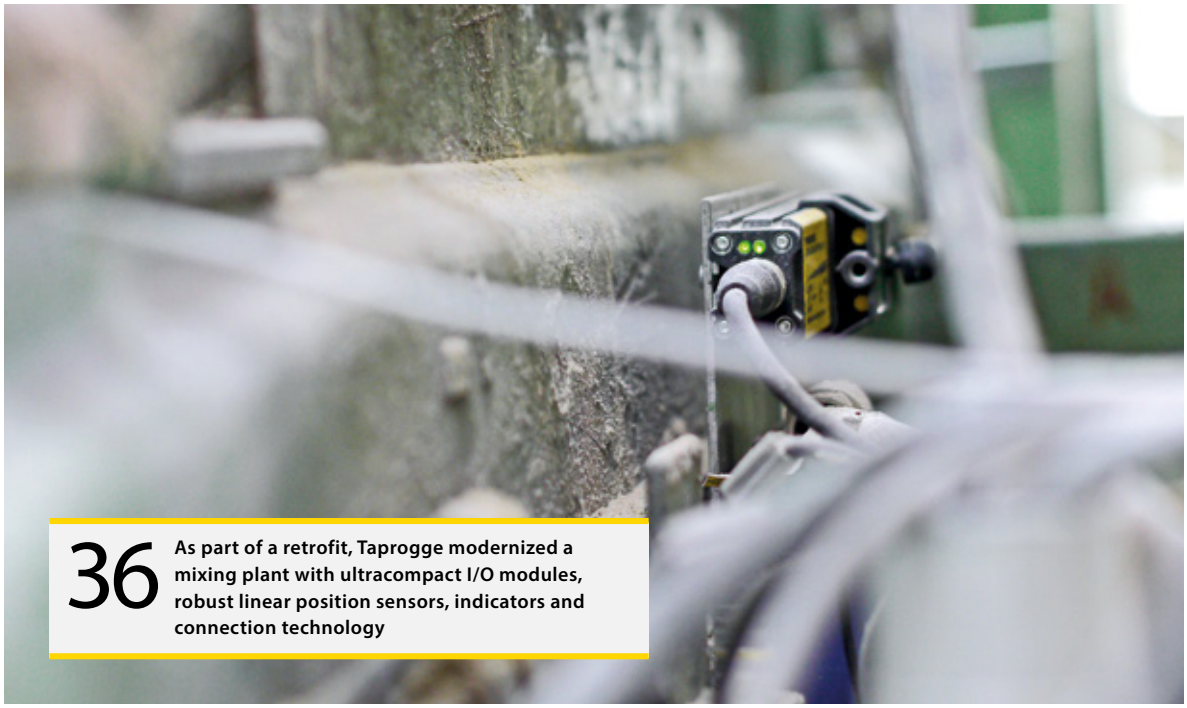

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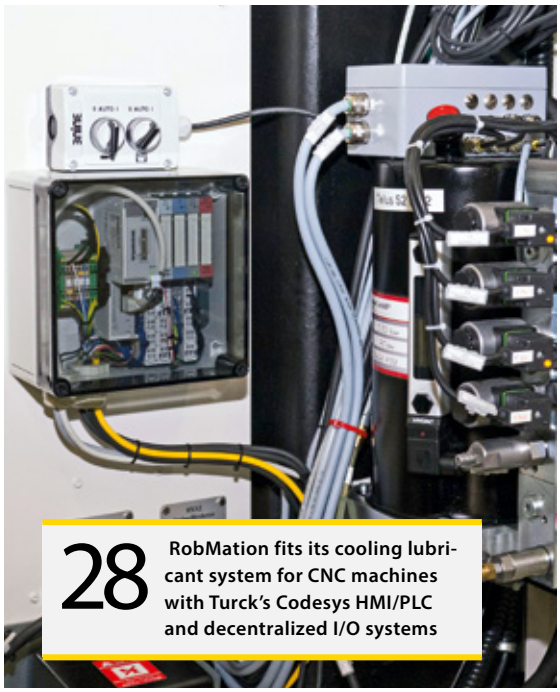

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Two-digit Growth for Turck Once More

The Turck Group is once more expecting two-digit growth in turnover for business year 2018. As Turck managing director Christian Wolf said at the annual press conference at the corporate headquarters in Mülheim an der Ruhr, the consolidated group turnover for business year 2018 is expected to exceed the 660 million euro mark. After 600 million euros in the previous year, this would represent a growth rate of 10 percent. In the reporting period the number of employees at all Turck sites worldwide has risen from 4500 to over 4800. Turck has around 2150 employees at the four German sites in Mülheim an der Ruhr, Halver, Beierfeld and Detmold, which is 100 more than in the previous year. "After the Turck Group already achieved its most successful business year in the company's history in 2017, this business year has likewise been very pleasing," Wolf said. "We could once more achieve two-digit growth everywhere, with virtually 20 percent particularly in the Asia-Pacific region, but also around 15 percent in the Europe/Middle East region. We were also pleased that the USA, our largest market, was able to keep up the impetus in growth from the previous year." After Turck with its strategic partner Banner Engineering founded the first joint venture in 2017 in the ASEAN region, both companies have this year continued their commitment to internationalization – each with one sales company in Malaysia and in Thailand. "We are seeing tremendous potential for the direct introduction of Industry 4.0 and IoT applications, particularly in Asia. We are already discussing with several customers in the region how we can best serve this demand with our Turck Cloud Solutions," Wolf commented on the ASEAN focus. Another sales company was formed in 2018 in South Africa.

UHF Reader Platform for Industry 4.0

more info on page 8

At the SPS IPC Drives fair, Turck will be presenting the first device in its Q300 UHF reader family with an Ethernet interface. RFID users particularly benefit from the range of platforms and interfaces of the Q300 readers. Up to four external antennas can be connected directly on the reader, thus considerably simplifying the creation of high performance gate applications in multiplex operation. The direct connection of triggers and signals via universal I/Os also simplifies the installation. With an output power of up to 2 W the readers can achieve very large read/write ranges.

Safety Box with IP65 Protection

As the world's first supplier of this new product, Turck now has a safety disconnection box with IP65 protection in its portfolio that reliably disconnects load currents up to 9 A in the field and is TÜV-certified. The TBSB Box expands the safety offer of the automation specialists and supports the trend towards cabinet-free machine installation through the use of decentralized safety solutions. Currents up to 2 A can be switched with Turck's TBPN/TBIP safety hybrid module, which combines four safety and four standard I/Os in a single IP67 block module. For higher load currents up to 9 A, the TBSB Safety Box is simply connected to the Turck hybrid module or to safety modules of other manufacturers. The robust design in the die-cast aluminum housing and the wide operating temperature range from -25 to +50 °C enable durable use of the modules in harsh industrial environments.

Wireless Cloud Gateways with UMTS and Wi-Fi

Turck's universal IoT gateways for the wireless connection to cloud solutions will enable machines and plants as well as measuring points at remote locations to be integrated simply into automation networks. With its extensive range of interfaces on offer, the TCG20 Series is specially tailored for the requirements of industrial automation. Three wireless variants are available: with UMTS, dual-band Wi-Fi as well as simultaneous UMTS and Wi-Fi. The range of networks and protocols is even greater in terms of automation infrastructure: The TCG20 Series thus offers a serial RS232/RS485 port, a CAN port and up to five Ethernet ports. Besides CANopen, the devices support Modbus TCP and RTU as master and slave, OPC UA as client and server and Codesys network variables.

M12 Field Wireable Push-In Connectors

M12 field wireable connectors with integrated push-in connection technology have been added to Turck's connectivity portfolio. The technology enables the user to complete rapid and safe manual assembly without the use of any tools. Soldering irons or screwdrivers are not required either. The customer just has to insert a stripped single wire end into the required contact area and establish electrical contact at the same time through the mechanical locking mechanism.

Major Expansion of Ultrasonic Sensors Portfolio

more info on page 24

Turck is expanding its RU ultrasonic sensor family with ten miniature ultrasonic sensors in M8 and M12 designs. In line with the RU series, the new M12 sensors are provided with an analog output and also a switching output with a switch range that always adjusts to the set measuring range limits of the analog output. Thanks to their compact IP67 design and narrow sonic cone, both sensor variants are ideal for use in small applications with restricted mounting conditions. The RU10U-M8 ultrasonic sensors are available in four variants: as a diffuse or opposed mode sensors each in PNP or NPN.

Linear Position Sensors Shock-Proof up to 200 g

The new generation of Turck's contactless Li Q25 positioning systems offers verfy high shock resistance and linearity compared to alternative measuring systems. With measuring lengths of up to two meters, the Li sensors outperform magnetostrictive linear position sensors, which, due to their operating principle, sense at a slower rate as the measuring length increases. The Extended series of the IP67 sensors are not only resistant to harsh environmental conditions such as from humidity and dirt. These devices reliably output a position signal when subject to vibration or shocks of up to 200 g. The scan rate is 5 kHz.

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Factor 1 Sensors in a Plastic Threaded Barrel

Inductive sensors in a plastic threaded barrel design and an antivalent output have been added to Turck's uprox series of factor 1 sensors that offer the same large switching distance to all metals. The new sensors combine the benefits of a one-piece barrel design with those of a closed front and translucent end cap. In this way, users benefit from the resulting increased sealing capacity and long service life. The translucent end cap enables status indication signals to be visible from all sides. This saves the user considerable time during commissioning or troubleshooting. The threaded barrel and front cap are made from liquid crystal polymer (LCP), and the end cap from Ultem. Both are highly durable plastics.

UHF-Handheld for the Smartphone

The PD20 expands Turck's RFID product portfolio with a UHF handheld for connecting to a smartphone. Users can control the PD20 via the free Turck app, which is installed on their Android or iOS smartphone or tablet. Depending on the RFID tag to be read and the environment, the device has a read range of two meters and more.

Codesys 3 HMI/PLC for Retrofit and Industry 4.0

more info on page 16

Some powerful devices with Codesys 3 programming are the latest additions to the TX HMI/PLC series. Compared to the established TX500 models, two central modifications have been added: The TX700 devices operate with multicore processors at an operating frequency of 800 MHz and use a modern Linux platform. This makes it possible to implement more complex control tasks and visualizations. The glass display of the TX700 units with a capacitive touch function enables intuitive operation with the gesture control typically used with smartphones. With their range of interfaces, the TX700 units offer versatile use straight from the factory.

Hubs and RFID Readers with IO-Link

Turck is expanding its extensive IO-Link portfolio with new Class A and Class B I/O hubs with protection to IP67 and HF RFID read/write heads with threaded barrels designs. Thanks to SIDI, the Simple IO-Link Device Configuration, the new IO-Link devices can be configured directly from the Profinet engineering system without the need for additional tools. The slimline 32 mm Class A I/O hubs of the TBIL-S series enable eight digital signals to be connected to an IO-Link master. The hubs thus reduce the wiring required for the final meters in machines and plants. Besides the TBIL-S3 with eight M8 sockets, Turck offers the TBIL-S4 variant in the same ultracompact design with eight universal I/Os on four M12 ports. The I/O hubs of the TBIL-M series offer eight M12 sockets for sensors and actuators. They comply with the Class B IO-Link specification, which offers additional passive safety.

RFID & WIRELESS IOT TOMORROW 2019

OCTOBER 29–30

in Darmstadt

More information on **RFID-WIOT-TOMORROW.COM**

New Sales Company in South Africa

Turck and Banner Engineering established a new joint venture in South Africa, by purchasing RET Automation Controls, their long-standing sales partner. The new sales company will be managed by Brandon Topham and Garth Cubitt, previous RET shareholders. The 14 existing RET employees will also remain in the new organization to keep providing support and expertise to sales partners and customers. "We are pleased that we can now take care of our customers in South Africa with our proprietary subsidiary and draw on the experience and know-how of our long standing sales partner RET," says Turck managing director Christian Wolf.

Opening of Training Center in Korea

Turck Korea officially opened its brand new training center. With the new training center, Turck wants to expand its service offering for its Asian customers. They will provide technical trainings to people involved in the automation industry as well as its employees and distributors. The Training center features a miniature demonstration of some of Turck's solutions for smart factories. This demonstration deploys various devices, such as sensor, RFID, smart camera and wireless systems for collecting, analyzing and querying data on cloud.

Galvanically Isolated HART Modules

The new HART modules with fully galvanically isolated channels prevent therefore any potential transfers and the resulting corruption of measured values. The temperature resistant HART modules for inputs (AIH401Ex) and outputs (AOH401Ex) enable Turck's excom I/O system to be used at all temperatures up to +70 °C. In this way, the I/O system can be placed even closer to the fieldbus instrumentation even under severe temperature conditions. The new HART modules process the information of multi-variable measuring devices, extended diagnostics or status information faster than previous devices. As the module provides its own communication controller for each channel, this information can be evaluated simultaneously.

Ultrasonic Sensors for the OEM Business

Turck is expanding its range of ultrasonic sensors with the RU50 Eco series for price sensitive OEM projects. The company was able to develop an ultrasonic sensor based on the latest sonic transducer technology, which does not make any compromises in quality in spite of its economy-based design. The devices in the plastic threaded barrel are made of highly resistant liquid crystal polymer (LCP), and the translucent end caps with an M12 connector output from Ultem. Both plastics have already proved their strength over long periods of use in other Turck products. The RU50 Eco sensor series is available with a switch output as well as with an analog voltage or current output signal. The customer can choose here between a variant with an M12 connector output and a variant with a cable output. Retro-reflective sensors are available for conveyor belt applications.

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Farewell to a Diva

Turck's Ethernet-capable two-watt Q300 read/write head increases the reliability of UHF RFID applications, and thanks to its external antennas, also enables use in the production environment close to the machine

For a long time, UHF RFID was considered the diva of industrial identification technology. This is because it is actually able to achieve great things and unbeatable when everything is working well, but is unfortunately often difficult to handle. If the environment is not right, the technology becomes unreliable. Metal objects or liquids cause reflections that subsequently result in overreaches or null spots. These issues then have to be rectified by means of mechanical measures, filters or algorithms in the middleware. UHF systems only read 99 percent reliably in the worst case. While this sounds very good, it means that ten read errors occur daily in an application with 1000 read operations. For a tracking system, these are far too many.

Due to these kinds of problems, machine building applications primarily use the HF frequency range, provided that the achievable ranges are enough. HF technology enables goods or workpiece carriers and also tool changers and forms to be detected very reliably in controlled and guided processes.

Identification beyond factory limits requires UHF

Products, however, increasingly have to be identified and traced beyond process sections and the limits of the factory. This is where HF technology reaches its limits. The short ranges do not provide the necessary flexibility for reliable identification in different production sections. UHF technology has therefore been used

Square-shaped, practical, good: Identification with the Q300 can be up and running with just an Ethernet cable

QUICK READ

Two watts of power, integrated RFID U interface, direct Ethernet connection with PoE and ports for up to four external antennas, four universal I/Os for trigger and status signals, reader variants with a Codesys, Linux, Windows or OPC UA platform – these are the basic specifications of Turck's new UHF RFID flag ship Q300. The reader can be easily installed, both in terms of software and hardware. The Q300 can be used both in logistics as well as in conventional HF domains, such as the identification of workpiece carriers in production. With its new read/write head, Turck is taking one step further towards Industry 4.0.

for a long time more widely than HF technology in logistics, where warehouse goods are mainly involved rather than components, primary products and products. Metal interference sources occur here less frequently than in production.

Industry 4.0 requires item level tagging
Nowadays in production there has been a growing demand for so-called item level tagging, i.e. the identification of individual components instead of the workpiece carrier. Especially in the automobile industry, there are now very few components that go through their production halls without carrying a tag. As is so often the case, car manufacturers have been the early adopters of the latest in production and automation technology. Other sectors are now following suit.

Q300 UHF reader enables UHF RFID in HF domains
With its Q300 UHF reader series, Turck is introducing new read/write heads that break down the limits between UHF and HF. The option to connect external near field antennas directly to the UHF read/write head enables the Q300 to also be used in conventional HF areas, such as for the optimal detection of components or workpiece carriers. Many of the problems normally associated with UHF can be avoided through the connection of special near field antennas. Conventional UHF read/write heads with an active antenna are normally too large and have too wide a radiation to be successfully used in the near field range.

The use of the Q300 for detection of workpiece carriers in a production line can also be attractive in terms of costs. The purchase of five read/write heads and an RFID interface is unnecessary, since the application can also be implemented with one Q300 and up to four external passive antennas. The read/write head detects which antenna is reading a tag and can thus assign the different read/write points. The use of an additional RFID interface with IP20 or IP67 protection is totally unnecessary, since this interface is already integrated in the housing of the Q300 with the antenna and processor.

Integrated universal I/Os for connecting trigger and light signals
The sensors are connected directly to the Q300 housing as triggers or actuators as well as signal lights for status signaling via I/Os. A separate I/O module for this is also unnecessary here since the reader features four universal M12 inputs or outputs.

Turck is initially offering a Codesys variant of its new UHF read/write head series in order to allow greater

Null spots caused by reflections on metal objects are prevented by the switchable polarization

The multiplex operation of external antennas on the Q300 also enables faster operation in gate applications in logistics

use of UHF in machine building and in the production environment near the controller. The third version of the open Codesys PLC language enjoys particular widespread use in machine building and for PLC programming. The Q300-CDS is the only UHF reader with a direct connection for Ethernet and external antennas, which can be programmed with Codesys.

The Q300-CDS is provided with the U interface already integrated. U stands for the universal interface and is normally used on Turck's TBEN-L and TBEN-S RFID block interfaces. The interface enables all the necessary parameters to be set both for HF as well as for UHF devices. Users who are already familiar with the U interface through the use of TBEN-L and TBEN-S RFID interfaces do not have to change anything. All others can master the technology quickly thanks to its intuitive operation.

Turck has integrated the platform of its TBEN-L block I/O devices in the housing of the new readers. The Codesys variants of the Q300 can consequently be used as a station in Profinet, Ethernet/IP or Modbus TCP networks without any intervention required of the user. The readers are also powered via the Ethernet cable. This power over Ethernet (PoE) technology keeps the wiring effort to a minimum. Even external I/Os can be powered up to a certain level via PoE. Only when power hungry actuators are used does an additional external power supply become necessary.

In 2019 Turck will offer a Linux and a Windows variant with Windows Embedded Compact 2013 on the market. Both devices are attractive for system integrators who run middleware on Linux or Windows systems. This software can be integrated and run directly on the Q300. The setup of often expensive industrial PCs is therefore no longer necessary as Q300 can communicate directly with ERP systems or other Ethernet stations. On both Linux and Windows variants, the applications can be programmed in the languages .Net, C++, C# in order to implement middleware functions.

Switchable polarization for greater read reliability
The Q300 can really show its strengths in material handling and intralogistics applications. With an output of two watts it can achieve maximum ranges. However, the high output power also brings with it several requirements. Waves are reflected from walls and metal objects or objects containing water, overlay each other and thus create overreaches or also null spots. In order to avoid these, the new Turck reader uses a technical trick. The polarization of the antenna can be switched so that tags are detected on different polarization planes. This increases detection reliability and increases the read and detection rate of tags in problematic environments.

Use in the automobile industry
The Q300 can also provide solutions in the automobile industry better than alternative UHF systems. Metal objects and not least the vehicles themselves are the frequent source of reflections. The polarization switching and the resulting maximum detection rate are therefore a great benefit. UHF is generally more widely used here than in other production industries, as components are also detected individually at tier X suppliers in order to implement seamless just-in-sequence production. The tags are attached anyway on most vehicle parts and car bodies.

Integration effort minimized – costs reduced
In individual cases very short ranges are also required in the automobile industry, for which special passive antennas are used. The location and assignment to component carriers is easier with external antennas which are specially suited to near field detection. Sophisticated algorithms in the software that would otherwise have to locate tags therefore become unnecessary. This saves money since the integration of RFID systems, particularly the programming effort required, often represents a major part of the costs.

RFID and OPC UA: Key technologies for Industry 4.0
RFID is a key technology of Industry 4.0 for networking machines, processes and data. Turck will consequently also be launching in 2019 a Q300 model with an OPC UA interface for direct communication with OPC UA clients. OPC UA increases future investment security for a customer's investment as well as the connectivity of the RFID solution. The independence of the protocol from operating systems also enables changes to be made to the corporate IT. The interconnectivity of production levels, identification systems and ERP or MES level remains unaffected by this.

»The Q300 is a versatile and powerful multi-tool for Industry 4.0 and the Industrial Internet of Things«

High-speed gate applications save time in logistics
UHF systems are frequently used in logistics to detect pallets, trays and other goods carriers. The Q300 with a two-watt output offers impressive results here as well as suitably large ranges. The Q300 with its integrated multiplex mode, which controls the external antennas in turn, simplifies gate applications in particular. Tags that pass the gate are thus read reliably and quickly. As the gates are installed on the usual routes, they save time in the process since the separate scanning of barcodes or other codes becomes unnecessary. The high-performance readers like the Q300 also make it unnecessary to reduce the speed.

Conclusion
The Q300 is an IP67 reader, which combines the entire RFID technology in a single housing, and provides a consistent separation between the production level and the corporate IT. This also simplifies the expansion of existing plants, since control cabinets or other complex installations and cabling are neither required in the field nor in the IT. Everything that is needed for item identification is integrated in the housing of the Q300. Only the Ethernet cable is needed to supply data to higher-level controllers or other IT systems. A more streamlined or process-friendly ID solution cannot be designed.

With its range of Ethernet interfaces (Profinet, Ethernet/IP, Modbus TCP) and platforms (Codesys, Linux, Windows, OPC UA), as well as the external antennas, Turck's new UHF read/write head is unique on the market. The Q300 can thus offer impressive results in UHF domains like logistics, as well as in conventional HF domains such as the production environment close to the controller.

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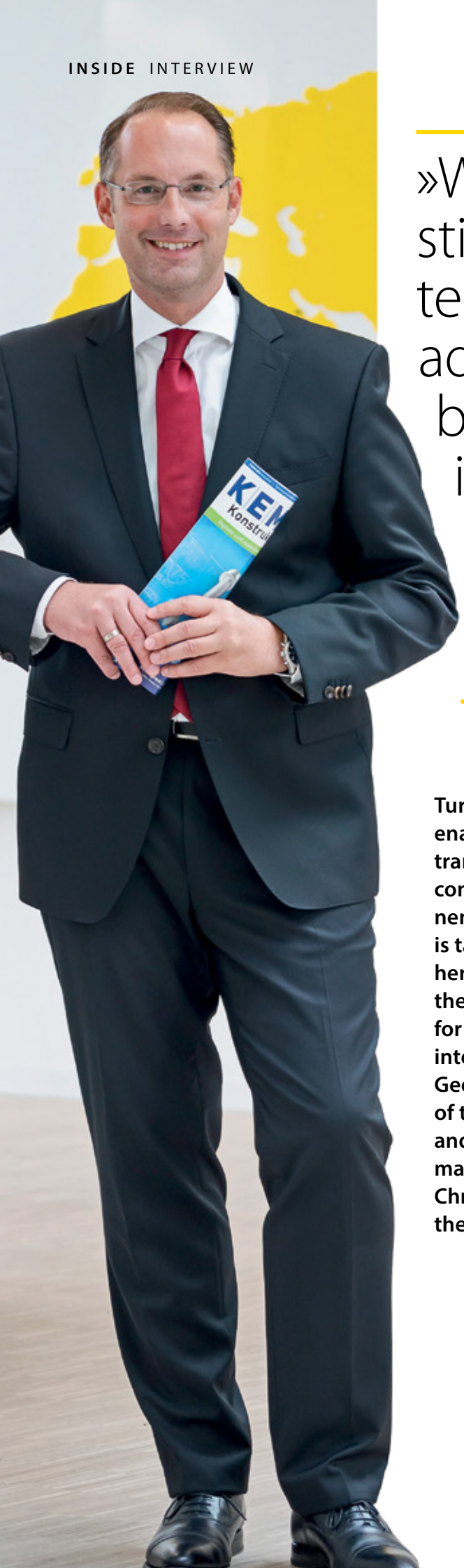

»While the controller was still the mother of all data ten years ago, the ongoing advance of digitalization is bringing with it the growing decentralization of intelligence in the field as well as in the cloud.«

Christian Wolf | Managing Director

Turck Cloud Solutions enable sensor data to be transferred directly from controller and I/O components to the cloud. Turck is taking one step further here towards becoming the automation partner for Industry 4.0. In an interview with Andreas Gees, deputy chief editor of technical journals KEM and elektro Automation, managing director Christian Wolf explains the strategy.

Turck has a flexible cloud offering in which profitability is the ultimate decider explains Wolf

How important are Industry 4.0 and digitalization for Turck?
While the sensors are selected according to the application, the control technology and automation infrastructure are mostly fixed. That's why it is so important for us as automation partners to get involved with the customer in the early stages of the decision making process. We will only be successful here if we can discuss holistic automation solutions with the customer. Having made the transition from a product supplier to a system supplier we are able to talk about Industry 4.0. While the controller was still the mother of all data ten years ago, the

ongoing advance of digitalization is bringing with it the growing decentralization of intelligence in the field as well as in the cloud.

Many companies are offering cloud solutions. Why is Turck also getting involved in IoT solutions in this area?
The subject of cloud solutions is often discussed on a very theoretical level even though little experience is available about the profitability of these concepts. Entering this field is important to us because we want to work out real use cases with the customers. After all, it will ultimately be profitability that determines the degree to which digitalization becomes established. For Turck it is therefore important to offer an in-house cloud solution for medium-sized machine builders. At the same time, we are ensuring connectivity to other cloud vendors. Major machine builders in particular will be running their own services and will only be using our cloud solution in a few cases. We see market potential with small and medium-sized companies in particular, also outside of Germany. In Asia the market is much more open to the issue of cloud technology.

Sensors are key components. What are the other technologies that you are focusing on in order to meet the growing requirements in the automation sector?
As a medium-sized company we need to support open standards. Besides the fieldbuses, this includes the Ethernet protocols as well as IO-Link as key technologies for Industry 4.0. Our sensors and automation components must be able to communicate with all clouds via TSN or OPC UA. We are keeping ourselves open, since it cannot be expected here that a universal standard will establish itself. For this we need a software platform that can adapt device data to any customer requirements. This is a key investment focus for Turck.

What is the future role of decentralized intelligence in field devices?
PC-based controller technology and decentralized intelligence in the IP67 range will significantly increase. As specialists in IP67, Turck has for a long time supported the transition from the control cabinet to the field installation. Today it is now possible to supply data selectively from the decentralized intelligence of an IP67 device in the field to higher-level systems. We are seeing how the controller world will change dramatically in the coming years.

Data is not only reaching the cloud via the controller but also via gateways directly from the sensors.
Very individual solutions will be developed. The supply of sensor data to the ERP is only one variant. Much of this data is not required here. However, this approach makes sense when the traceability of a product via RFID is required. Our sensors transfer their information via the fieldbus to the controller and only a little of this ends up in the cloud. I need data in the ERP system that is relevant to the product and the process. The sensor data describes the state of a machine and can become irrelevant after a short time. However, we see a benefit in the sensor data being pre-processed, such as in an intelligent decentralized IP67 I/O module.

Your multiprotocol block I/O PLC provides customers with hardware for decentralized control. Is there any other hardware available?
More interfaces will be added, but also devices for the IP20 area. In addition to the block I/O PLCs, we are currently offering HMI PLCs and basic HMIs. Our philosophy is based on bringing decentralized intelligence to the machine. Although this focuses on IP67, other variants will also be available. Controller technology will become a key part of our portfolio.

Through the acquisition last year of Vilant, Turck has acquired considerable software expertise for RFID. What will be the role of Turck Vilant Systems?
Hardware only plays a secondary role in RFID applications in the UHF range. The optimum control of processes and the ability to process them in software is critical for the user. The core expertise of Turck Vilant Systems is the representation of the entire process between the UHF tag and ERP system in the software and in the integration. Although we have devices in the program the customer also expects a comprehensive service. Turck Vilant Systems is for us a reliable partner in the team.

Where does Turck see its future? As a data collector or as a specialist for extensive data analysis?
The new and also disruptive business models also represent a challenge for Turck. What counts for tomorrow's users is the availability of their machinery. As a supplier of a service contract, we also have to be able to access the data and analyze it, so that these findings can help to prevent failures. That's why we at Turck also have to develop our view towards data analysis. The aim of modern business models is to manage holistic processes safely.

Wolf: "Today it is now possible to supply data selectively from the decentralized intelligence of an IP67 device in the field to higher-level systems."

Why has Turck acquired the Kolibri protocol from Beck IPC for encrypted communication to the cloud?
The Kolibri protocol is a web-based, bidirectional communication system that is encrypted. The technology buy-out consists of the protocol and the software required to use the protocol. As part of the technology buy-out we will also be advancing the joint development while the technology completely belongs to Turck. This is important since our customers need the security in knowing that their partner will also be available tomorrow.

Several vendors offer sensors that are easy to install and are suitable for preventative maintenance. Will other sensors be needed for IoT?
We are also seeing this development and are working on these solutions. Our CCM module (Cabinet Condition Monitoring), for example, monitors the temperature, humidity and door closure in control cabinets. Other examples include the vibration sensors to implement predictive analytics or radar measurement technology. Artificial intelligence makes it possible to detect any anomalies. For this reason alone, these kinds of sensors are on the rise.

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Always fits: The TX700 is available with 5, 7, 10, 15 and 21 inch screen diagonals

Retrofit for Industry 4.0

The new TX700 HMI/PLC generation combines established interfaces and machines with the production of the future

Multilingualism and translation expertise are also increasingly valued and required in the world of industrial automation. Modern languages and protocols such as OPC UA are required in order to retain connectivity for networking machines with office IT networks or cloud services,. However, nobody will sell their existing machine park just because it would be useful to remotely diagnose problems in their own production facility. Why should a working valve block or an industrial printer be removed just because of its outdated RS232 interface? That is neither efficient nor necessary. Smart automation does not mean ripping

QUICK READ

The new generation of the TX700 HMI/LC series can control and visualize even more complex processes and applications than before. Thanks to several interfaces and an integrated OPC UA server, the device generation is well set for the future of automation. The TX700 particularly enables customers looking for a versatile controller that is suitable for use in different applications to keep their stock at manageable levels. Users requiring elementary display devices without a control function will also find a solution in the devices of the TX100 series.

out all proven equipment from the halls, but enhancing tried and tested equipment with the benefits and extras of modern systems.

Proven components for modern automation
Existing actuators and mechanical components often continue to be used in retrofit projects and are upgraded with modern sensors and control technology. For example, modern HMIs can thus be used to replace basic pushbutton actuators and custom-built control panels. The TX700 HMI/PLC series is particularly used in these kinds of retrofit projects. Compared to basic pushbuttons and analog controllers, the touch display increases control flexibility for machinery. The direct visual feedback increases user-friendliness and enables additional data to be displayed in the field: Fill levels, temperatures or pressures can be displayed as required. The display of histograms or any maintenance work due increases the availability of a machine without the use of any elaborate concepts for predictive maintenance.
The interfaces of the TX700 also follow this strategy: Keeping what's been tried and tested and opening it for modern automation concepts. As already the case with the TX500 series, the TX700 series come as standard for use also as a master in Profinet, Ethernet/IP, Modbus TCP, Modbus RTU and CANopen networks without any additional licensing requirements. It can also be used as a slave in both Modbus networks.

Three Ethernet ports, a serial interface, two USB ports and an SD card slot are provided as physical interfaces. Thanks to the three Ethernet ports, different Ethernet communication to the corporate network or cloud services can be physically hard separated from the realtime communication with I/Os in machine and plant networks. The three RJ45 sockets are also useful for connecting a maintenance PC or establishing a switch for linear topologies by bridging two ports. The TX700 is available with 5, 7, 10, 15 and 21 inch screen diagonals.

Increased performance for demanding processes
Unlike the predecessors of the TX500 series, the TX700 devices run on a real-time Linux operating system instead of the Windows Embedded platform. This releases additional performance, which in conjunction with the increased processor performance enables applications with more complex visualizations and many stations in the Ethernet network to be implemented. The glass display is provided with a capacitive touch functionality and gesture control with swipe and zoom operation. Most users will not want to change the standard gesture control features to ensure intuitive device operation. However, this can be modified at any time during programming if required.

IoT gateway on board
Besides the increased performance, the TX700 offers a decisive benefit. In addition to its use as a PLC and HMI, users can also deploy the devices as an IoT

More interfaces than an internet cafe: The TX700 can be used as a master in five networks. As a slave or server it supports Modbus TCP and RTU as well as OPC UA

gateway. This is made possible by the integrated OPC UA server that enables the transfer to higher-level systems. This simplifies the monitoring of machine states and processes via cloud services right through to data evaluation for predictive maintenance.

The connection to Turck's proprietary Turck cloud will be made even simpler in future. Values and variables for transfer to the cloud can then be defined via check boxes in Codesys. The Kolibri encrypted protocol makes the transfer to the Turck Cloud Solutions particularly secure. Anyone wishing to use the MQTT protocol for transferring their machine data to a different cloud can already purchase ready-to-use MQTT function blocks for Codesys and also use these on the TX700.

Remote maintenance saves nerves – and travel expenses

The TX700 devices can be easily configured via the system settings menu. External tools are not required. However, the system settings menu can also be opened via a browser on a PC. This enables the settings to be carried out conveniently via the mouse and keyboard. The integrated VNC server is another remote option. It can also be used to mirror the screen content of the TX700 with a VNC client on a PC. In this way, the entire HMI can be operated remotely. This option is particularly useful for support tasks for maintaining machines remotely. With an additional web visualization it is also possible for user groups other than the machine operator to display those graphics and visualizations that are important for them. Whether it is for management, work scheduling or maintenance – each user group has its own specific questions for a machine, which can be answered quickly with customized views for each group.

Codesys 3: Flexibility for PLC programmers

Like their predecessors, the TX700s use a Codesys 3 controller for programming the PLC functionality. Codesys is widely used by many PLC programmers because the PLC software is designed as an open community solution, enabling all users to benefit from the experience of other users via the Codesys forums and free OSCAT libraries.

Anyone not wishing to design their visualizations with Codesys TargetVisu can switch to Turck's alternative TX VisuPro visualization editor at any time and at no extra charge. TX VisuPro is a state-of-the-art software package to develop modern and user-friendly graphical user interfaces. It supports a wide range of drivers which also enable connection to the controllers of many other manufacturers including for example Siemens, Beckhoff, Rockwell or Schneider. OPC UA is also integrated, both as a server and as a client. The HMI displays with TX VisuPro can also access the data of several different controllers. Depending on the device, up to eight communication relations can be established simultaneously. In this way, several plant and machine components with their own controllers can be combined and displayed on a central HMI. The web visualization function is also possible with TX VisuPro.

Conclusion

The TX700 cannot be put easily into a particular box. It is always a case of "not only but also" and never "either or". The device can be used both a PLC and HMI, both for established protocols as well as for modern Ethernet networks. It is both available in the five inch smartphone format as well as in the PC 21 inch format. The device can particularly help customers today using different types of PLCs and HMIs to effectively reduce the number of devices to be kept in stock.

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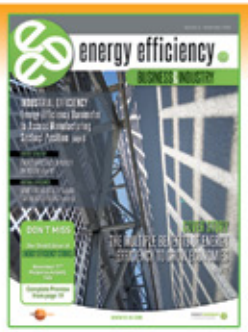

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Long Awaited

Contactless inductive linear position sensor systems were previously restricted to short measuring distances. However, Turck has now further developed its Li series inductive linear position sensors so that they now achieve measuring lengths of up to two meters

Even with a measuring length of two meters, Turck's inductive linear position sensor system achieves its high linearity values and samples the measured value at a sampling rate of 5 kHz

Trends have a sell-by date. Initially only a few "early adopters" have the new product. Bystanders continue to look on and some ask a few questions. People in the business world are invited to congresses and podium discussions about the new subject. After some time and depending on the area, the trend becomes standard, main stream or state of the art, or it dies the quiet death of the few good ideas.

A few years ago, the highly dynamic measurement of linear movements over entire ranges of travel could be considered to be a trend in machine building. Today, this has become a standard application. If dynamic movements have to be measured without a large dead time, such as in pick-and-place applications, the position of the moved unit must be known at any time. This can be done indirectly via encoders on the drive or directly on the moved axis with linear position sensors. Immediate position sensing directly on the axis offers high precision and excludes any inaccuracies caused by transfer elements from the drive to the axis as well as any play.

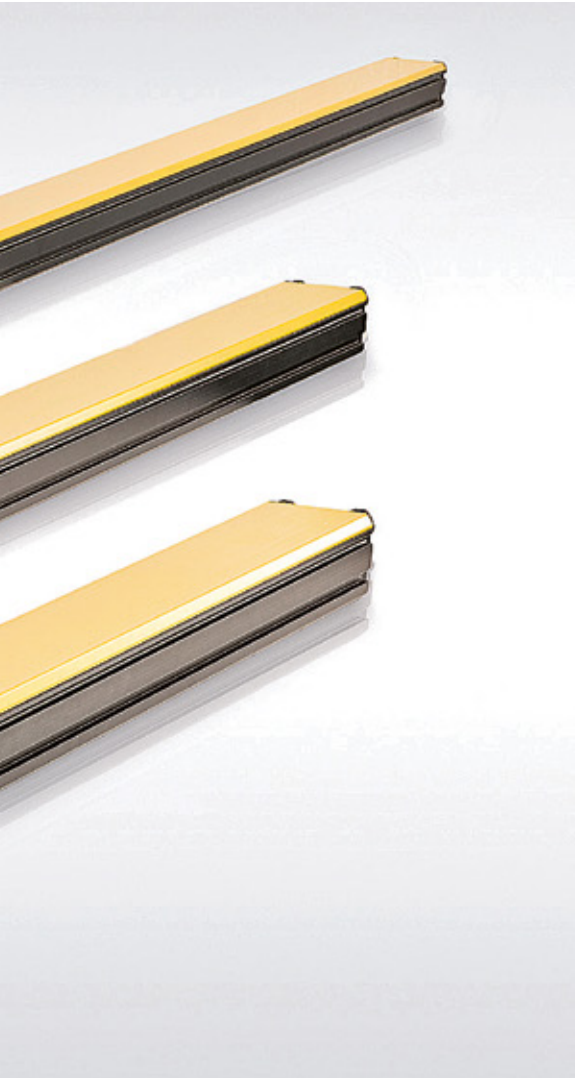
Linear position sensing: potentiometric, magnetostrictive or inductive

Three measuring principles represent the leading methods of measuring linear movements in industrial

automation: The potentiometric, the magnetostrictive and for almost ten years now the inductive measuring principle. Besides these types, magnetically coded or optical measuring systems are also used.

Potentiometric and magnetostrictive measuring systems are the most widely used systems. Like everything else, these also have their benefits and disadvantages. Potentiometers do not have contactless operation. A load-free and play-free coupling between the measuring system and the moved unit to be measured is absolutely essential in order to minimize wear. Too much pressure or too many knocks on the moved unit may considerably increase the wear of the wiper inside the potentiometer. This system therefore requires a lot more care when mounting than with other systems. The mechanical coupling of the slide contact on the conductor can also be a problem if dust or condensation get inside the devices. This becomes increasingly more likely as the sensor seals age and thus also impairs measurement. The characteristics of the sensor change, mostly unnoticed by the operator.

Magnetostrictive systems are designed for contactless operation so that the above disadvantage is excluded; a high level of vibration and severe shock, however, also impair linearity here, and dynamic properties are lost as the measuring length increases.



After all, the further away a measuring point is located from the processor unit, the longer the time required for the measured value to be determined, so that the sampling rate has to be reduced. The installation of this system in the metal industries is not recommended without protection. Metal dust can easily adhere to the magnetic positioning element, causing linearity errors in the sensor. However, it is the ideal solution as a protected mounting inside a fluid cylinder and is offered by Turck as LTX or LTE for mobile applications.

»Turck's Li Sensor provides consistently accurate readings – even with vibrations or shocks up to 200 g«

Inductive measuring principle eliminates disadvantages

The new generation of inductive linear measurement solutions from Turck eliminates the disadvantages of potentiometric and magnetostrictive sensors and combines their benefits. The Li sensors offer virtually as fast and high resolution operation as potentiometers while being considerably more shock-proof than magnetostrictive systems. This also offers impressive results with a high degree of immunity to magnetic fields, less linearity error and a high repeatability of the measuring signal.

High five kilohertz sampling rate

The Turck automation specialists are the first manufacturers in the world to offer inductive linear position sensors in lengths of up to two meters. The long

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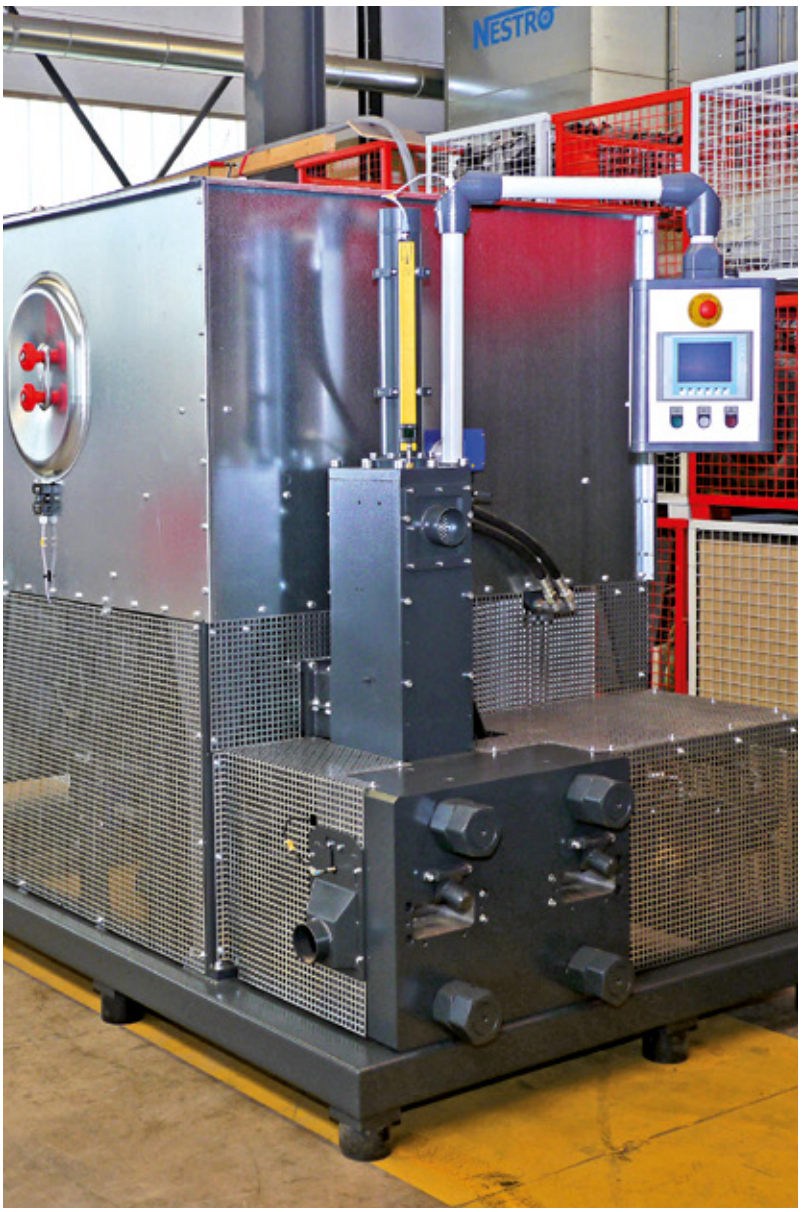
Turck's inductive linear position sensors have been able to offer outstanding performance in many applications, thanks to their combination of robust design, precision, immunity to magnetic fields and high resolution. Turck is now presenting a new generation of the inductive Li linear position sensor series with devices for measuring lengths from 0.1 to 2 meters. The sensor series upgrade also includes an increase in the sampling rate to 5 kilohertz and the shock resistance of the device to 200 g. Alternative measuring principles can no longer compete with these specifications.



The compact briquetting press from Weima has already been operating with an Li sensor for years – models for large measuring distances up to two meters are available

variants are often required by customers who up to now use magnetostrictive systems and have to accept their disadvantages. The reduced sampling rate for long sensors and the resulting non-linearity in particular often led to unsatisfactory solutions such as extrapolated measured values. With measuring lengths over a meter, potentiometers were an unlikely alternative: The production of such a long and precise conductor path, and thus the sensor itself, is very expensive. Whoever can afford it must nevertheless live with the mechanical disadvantages of the potentiometers.

Shock-proof up to 200g

The entire series of the new inductive Li linear position sensors was also improved in other key areas besides the measuring length. All devices now withstand even greater shocks up to 200 g and severe vibrations. However, unlike other systems they also maintain their linearity values even during the shocks and vibrations. With magnetostrictive systems on the other hand, the waveguide in the metal rod buckles at the moment of shock. Its length changes indirectly in relation to the processing unit so that magnetostrictive systems produce a corrupted measured value. If the shock spectrum is on the resonant frequency of the magnetostrictive sensor, measurement is permanently prevented.

The inductive Li sensors benefit from their electromagnetic design. The system tolerates a lateral and horizontal offset of the positioning element to the sensor profile without any loss in the position signal. This function ensures reliable measured values particularly when used on vibrating machines, such as in marking presses.

The sampling rate of the device was also increased to five kilohertz throughout irrespective of the measuring length. This minimizes positioning errors in highly dynamic applications. The measuring principle of magnetostrictive systems prevents them from achieving these sampling rates without interpolation. These become also slower the longer the measuring distance. The torsional wave, which through the measuring principle moves from the positioning element towards the processing unit, is simply too slow compared to the speed of the electrical signal.

16-bit resolution

All Li sensors also now convert a 16-bit resolution digital signal to the appropriate output signal, such as to a 4...20 milliampere analog signal or 0...10 volt signal. Turck has also provided the new devices with an error diagnostic value. If the device does not detect a positioning element, the output signal is set to 22 milliamperes or 11 volts. This function is very useful, particularly for online sensor diagnostics or for detecting mechanical defects on the machine.
The new Li devices are initially available as analog

Inductive linear position sensor system

Turck's inductive linear position sensor system is based on the so-called resonator principle. Unlike magnetostrictive sensors, position sensing is not implemented via a magnetic positioning element, but with a resonator, i.e. an oscillating system consisting of a capacitor and a coil. Operating principle: A transmission coil installed in the IP67 sensor housing generates an alternating field which excites the positioning element. This then induces a voltage in the receiver coils of the sensor. The internal 16-bit processor determines the exact position from the induced voltage.

Potentiometric linear position sensor system

Like any potentiometer, potentiometric linear position sensor systems operate with a resistor with a movable pickup – the slide contact. With linear position sensors the slide contact is the positioning element. Due to their operating principle, non-contact operation is not possible with these systems. However, they are normally designed in housings with a positioning rod, which thus achieve IP67. The seals at the output of the positioning rod are the Achilles heel of the potentiometers. Wear and friction affect them over time. The measuring lengths of linear potentiometers are theoretically unlimited. However, for actual industrial applications there are very few models with measuring lengths over a meter, as this involves much higher manufacturing costs.

variants with a combined voltage/current output. The device is factory set to output both values simultaneously, the voltage value via pin 4 and the current value via pin 2. This enables the user to use a value to operate a control display unit in the field and thus send the other value to the higher-level machine controller. A second position signal is also useful for diagnostic tasks. Correct operation is indicated as long as the absolute position of the output signal on pin 4 equals the signal on pin 2.

Easy-teach for commissioning and mounting

Turck's Easy-teach function enables all Li sensors to be set to the start and end point of a measuring section. The measuring signal can also be inverted, so that the start and end point of the measurement are reversed. The status LEDs on the sensor head indicate to the operator directly whether the Teach operation was successful. This teach process enables the sensor to be adjusted flexibly to the specific requirements at the installation and thus simplifies commissioning.

Linear position sensors for use in large presses

Precise linear positioning with measuring lengths over one meter is particularly required in large machines. Previously it was necessary to use alternative measuring systems here and live with their disadvantages, such as accepting a loss in sensor and machine performance. This is the case, for example, in presses with high shock loads, which nevertheless require precise measurement results.

In wood processing machines, where large measuring lengths are often required, linear position sensors are also subjected to vibration and shock, while sawdust and other dust also play their part. In these types of applications, IP67 protection is mandatory. The new Li Q25 generation meets both requirements and thus raises the bar even higher in terms of linear position sensing.

The sensor withstands vibrations and shocks of up to 200 g and supplies consistently precise measured values

Magnetostrictive linear position sensor system

The sensor unit sends an electronic start pulse along a waveguide. This pulse causes the magnetic positioning element to generate a torsional wave in the waveguide, which runs from the positioning element towards the sensor unit. The elapsed time from the pulse to the detected torsional wave is measured, from which the distance to the positioning element is calculated. The maximum sampling rate of the system is not only limited by the electronic components but also by the time required by the torsional wave. The measuring length of magnetostrictive sensors is virtually unlimited, however, the sampling rate decreases the longer the measuring length.

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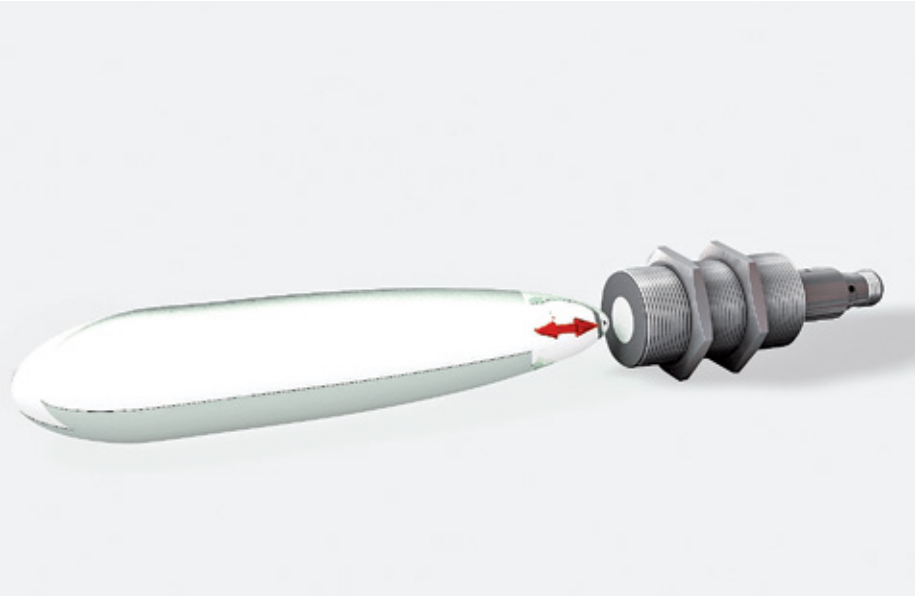
Good to Hear

Turck's ultrasonic sensor portfolio, with its additional 22 new types, offers customers a solution for every application



Large range – short blind zone: The Turck ultrasonic sensors can also be used effectively in restricted mounting spaces

Bigger, higher, further – these were the aims of the 20th century. However, with the onset of Industry 4.0, there is an increasing demand for small devices that can offer the same measuring accuracy over long distances as over short ones. After all, applications are becoming smaller whilst installation space is becoming more restricted and at a considerable premium. There is a continuous change between sending and receiving; blind zones that are too large are a problem for many applications involving short distances. Turck's miniature sensor system provides a solution since the small devices keep the blind zones to a minimum while still guaranteeing accurate measuring results. Turck has expanded its ultrasonic sensor portfolio with 22 new compact sensors.

Multiple benefits from ultrasonic sensors

Ultrasonic sensors are the optimum solution for many applications where space is restricted and in which sensors are used for distance measurement or similar metrics, as they offer here several benefits compared to other solutions. An optical sensor is subject to dirt so that the user has to regularly clean it. Ultrasonic sensors on the other hand are insensitive to dirt, dust and even water. They always offer reliable operation. Ultrasonic sensors also detect every object, irrespective of the structure and color of its surface – another critical benefit compared to optical sensors.

However, ultrasonic sensors are not only superior in many respects to optical sensors. Unlike inductive sensors, which only detect metals, ultrasonic sensors can detect any medium. This also applies to plastic, which makes them also one step ahead of capacitive sensors. Capacitive sensors are also several times more susceptible to dirt than ultrasonic sensors.

Robust, compact, self-cleaning

Turck's ultrasonic sensors have all these features – and more. Their highly robust housing with a continuous threaded barrel entirely made of metal is particularly short and stands out on account of a metal connector which is manufactured as one piece with the threaded sleeve. This eliminates any potential weak points that could cause damage in harsh environments and at low temperatures. The thread runs over the entire length of the sensor so that the mounting position can be varied as required within the mounting bracket. The connector can also not break off since it is made entirely of metal.

Turck ultrasonic sensors also have a smooth sonic transducer front, which reliably prevents contamination and the formation of particle deposits. The mechanical movement of the membrane even shakes off deposits and is thus virtually self-cleaning. Particle deposits that can occur when the air humidity is high can likewise be simply wiped off completely, without any residue remaining in the transition area between the transducer layer and the transducer ring. Damage arising from sharp and pointed cleaning objects therefore becomes a thing of the past.

Turck's ultrasonic sensors are developed so that typical industrial noise has no effect on sensor operation. Neither whistling noises from compressed nor the noise of metal objects hitting each other prevent the RU ultrasonic sensors in their work.

QUICK READ

The more compact the machine and plants, the greater the demand for small sensors. If these devices also involve short blind zones, they soon become the universal tool for restricted spaces. Turck has therefore added ten more miniature sensors to its RU ultrasonic sensor series. Twelve new types were added to the RU-Eco series with devices made from highly resistant liquid crystal polymer. This comprehensive portfolio enables the automation specialist to offer the right ultrasonic solution for virtually every application.

Easy Teach function
In order for the user to set the sensors simply and intuitively without a PC, all ultrasonic sensors of the RU series can be set with a simple teach-in function. The start of switch and measuring ranges can thus be set easily without the use of any external software. The teach operation is carried out via the teach adapter or via sensor variants with integrated push-buttons. The pushbuttons are fitted inside the metal housing and are thus protected from accidental actuation. The setting is carried out inside a fixed time window after a preceding voltage reset. The subsequent automatic lock reliably excludes the possibility of the sensor settings from being accidentally changed.

Miniature ultrasonic sensors of the RU series
The new RU10U-M08, RU20U-M12 and RU40U-M12 miniature ultrasonic sensors are not only all-round talents, but are also optimally suited for requirements in Industry 4.0 applications, thanks to their compact 8 and 12 millimeter design. The ultra compact RU10U-M08 sensors are the smallest ultrasonic sensors available on the market. They are available as diffuse mode or opposed mode sensors, each with PNP or NPN interfaces and IO-Link functions. They have a range of 100 mm and a blind zone of just 20 millimeters.

The small ultrasonic sensors in the M12 threaded barrel are available in six new versions: Four types come with an analog output and two variants with a switching output. The ultrasonic sensors with a switching output also come with integrated IO-Link functionality. The customer has the choice between sensors with a 200 or 400 mm range; in both cases the blind zones are small and are just 20 or 40 millimeters.

Miniature sensors for fill level applications
Turck's RU10U-M08 miniature ultrasonic sensors are particularly suitable for applications such as the fill level control of vessels with small openings, including bottles, test tubes or other tube-shaped containers. Immediately after filling there is a small stop in filling plants. This moment is used by the RU10U-M08 in order to "listen" into the particular vessel and check its fill level. For this it either outputs a specific measured value or a switching window. The switch window indicates whether the fill level is correct or not. Thanks to its small design, the sensor can optimally look into the vessel from above without a focusing device. Only

Complete program: Turck's extended portfolio now provides customers with ultrasonic sensors for virtually every application

The miniature sensors in M8 and M12 housings are made from a single unit and offer impressive performance with short blind zones

The Eco series in robust plastic housings is optimally suited for the price sensitive OEM business

if this check is positive, is the bottle or tube provided with a stopper. The M8 miniature ultrasonic sensor is therefore optimally suited for applications in the pharmaceutical or cosmetic sector.

Tool control with miniature ultrasonic sensors
Turck's RU20U-M12 and RU40U-M12 miniature ultrasonic sensors are suitable for near field applications. The sensors are also suitable for controlling tools, such as for checking drills in a machining center. The M12 ultrasonic sensors can monitor whether the drill is still present. This makes it possible to determine defects early on in order to prevent rejects.

Ultrasonic sensors for the OEM business: RU50-Eco
Turck's RU50U Eco series consists of a plastic threaded barrel and is therefore ideal for price sensitive OEM projects. The sensors are made of highly resistant liquid crystal polymer (LCP), and the translucent end caps with an M12 connector output from Ultem. Both plastics have already proved their strength over long periods of use in other Turck products. The sensors of the RU50U Eco series are available with a switch output as well as with an analog voltage and current output signal. The customer can choose here between a variant with a connector output and one with a cable output. Turck is adding a total of 12 new types to its Eco series.

Benefits of RU50-Eco in conveyor belt applications
Retroreflective sensors are available for conveyor belt applications. These can be taught by the user to keep a fixed distance in relation to a reference object. The devices reliably detect all objects between the sensor and the reference point. The translucent end cap also offers the advantage of being able to detect the switching distance of the sensor from virtually any viewing angle. The RU50-Eco sensors are particularly suitable for intralogistics applications, since the Eco enables the drive rollers of the conveyor belts to be selectively controlled. This makes it possible to only operate the roller that is currently required. In this way, running the entire plant is unnecessary, thus saving energy and keeping roller wear to a minimum.

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Operating principle

Ultrasonic sensors primarily operate using the time of flight measuring principle. The sensor emits a sonic pulse and receives the sound reflected back by objects. The time of flight between the emitted pulse and the received pulse enables ultrasonic sensors to be used not only for the discrete detection of objects, but also for measuring distances and for the output of an analog signal if required.

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The central lubrication system supplies four machining centers with coolants (KSS) – controlled by Turck's TX513 HMI/PLC

Connect Four

A central cooling lubricant processing plant supplies four milling machines of auto parts supplier Ovalo – controlled and visualized with Turck's Codesys programmable TX513 HMI/PLC

CNC machines, milling systems, machining centers and all types of machine tools for metal processing must be provided with permanent lubrication. For this the machines spray liquid coolant (KSS) onto the workpieces and tools during the machining process. The KSS coolant removes the heat, reduces friction and ensures the removal of metal shavings during the metal cutting process. Without the cooling lubricant, the quality of the workpiece is reduced, as well as the precision and service life of the tools.

Each machine normally has its own cooling lubricant supply system. These are filled with the KSS coolant concentrate, which is diluted with water for use in the process. The correct concentration and temperature of the KSS coolant, as well as the minimum contamination by particulate matter and metal shavings, must be ensured in order to achieve the constant quality of the workpiece. As the coolant reduces due to evaporation and sticking to the components, it must be filled with water and cooling lubricant concentrate. This is normally done by employees in the metal processing plants. They regularly check the quality and the fill level of the cooling lubricant. This is a task that is sometimes neglected due to time pressure, and can be expensive if the machine has already been producing rejects.

Automated processing of the cooling lubricant

To avoid this problem, RobMation GmbH, the system integrator and specialist for "unmanned manufacturing" based in Baesweiler near Aachen, developed a central system for treating cooling lubricants. Sensors here determine the concentration, purity, fill level and the temperature of the cooling lubricant. This data is used by a controller to remove or pump the cooling lubricant from or to the machine tools depending on its quality. Used KSS coolant is pumped out of the machines into the central processing plant. The concentrate and the water are then added for treatment in the processing plant. Heat exchangers regulate the temperature. The costs for this central processing plant are paid off very quickly as it can serve four connected machine tools directly.

Autonomous, versatile HMI controller

A separate controller was required to operate the central lubrication plant independently from the connected machine tools. The integrator therefore looked for a stand-alone and flexible controller with integrated visualization. This had to be mounted on the central lubrication plant in order to control it, as well as to display the histograms of cooling lubricant consumption and condition for all four connected machines. Leon Heuschen, customer advisor at wholesalers EGU, suggested Turck's TX513 HMI for controlling the central processing plant. The HMI is provided with a Codesys 3 controller and several Ethernet and serial interfaces.

The devices can be used as masters in Profinet and Ethernet IP networks, and even as masters or slaves (clients or servers) in Modbus TCP or Modbus RTU networks. The HMI communicates via Profinet with the gateways of the Turck BL20 I/O system, which are located in a switch box on each of the four CNC machines. The sensors and actuators that measure and regulate the condition of the KSS coolant in the CNC machines are connected to the local BL20 gateways.

Solution with Turck support

The control program for this was written by the RobMation programmers themselves on the Codesys 3 platform of the TX513. Employees at Ovalo GmbH control the processing plant via the HMI. As the set values stay the same, any interventions are normally not required. The KSS coolant is pumped as a concentrate by the machine from a barrel, which lasts for a long time. The machine is connected directly to a water pipe for the fresh water supply.

RobMation required application support from Turck as it could not optimally implement all the required functions using TX513 with Codesys Target Visu in the standard version. After consulting with Turck, the powerful TX VisuPro visualization software was installed, which Turck offers free of charge for its HMI systems. This now enables trend recordings as well as

QUICK READ

Integrator RobMation GmbH installed a central cooling lubricant plant for CNC machines at auto parts supplier Ovalo GmbH. While Turck's TX513 Codesys HMI controls the plant and visualizes the process, modular BL20 I/O systems connect actuators and sensors via Profinet. Thanks to the different interfaces provided by the TX513, as well as the BL20 Ethernet multiprotocol gateways, RobMation is able to minimize the number of device variants that have to be kept in stock.

»In Germany, RobMation offers 24-hour support. This means that we rectify any faults onsite within this time. That's why we like to use components that we can use flexibly and for which we can just keep one variant in stock.«

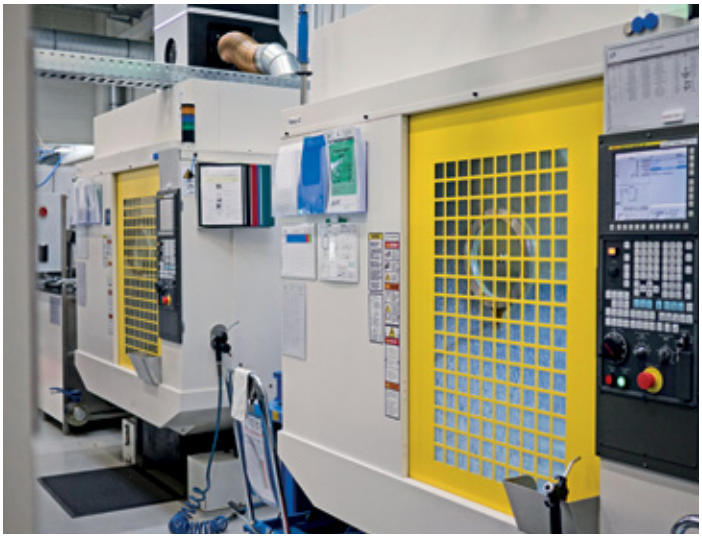
Thomas Schulz | RobMation GmbH

The barrel containing Robsol, RobMation's proprietary KSS coolant concentrate, is positioned at the back of the processing plant

plots of the central fill levels, temperatures and other measured data to be powerfully displayed in the standard version. "Even if the TX513 could not depict everything how we wanted it initially, we are on the way to a good result with Turck's support. Turck's support has always provided competent and prompt assistance. We noticed how the support provided for our inquiries was treated with the necessary urgency and ultimately resulted in a solution for us," Thomas Schulz, managing sales engineer at RobMation GmbH, describes his experience.

BL20 gateways reduce stock keeping

The BL20 gateways, as multiprotocol Ethernet I/O modules, can be used with Profinet, Ethernet/IP or Modbus TCP in Ethernet networks. "We don't want to



Communication with the KSS units of the four machines is implemented via Profinet

The central BL20 I/O station is located on the central lubrication plant and forwards all signals via Profinet to the TX513 HMI

use products just for one task," Schulz says and thus gives one of the reasons for choosing the TX513 HMI and the BL20 systems. "For example, if there is a shortage of inputs or outputs in the field, I want to have a protocol via which I can also reach Fanuc machines. However, I still want to be open enough for the interface of one customer who uses robots of other manufacturers.

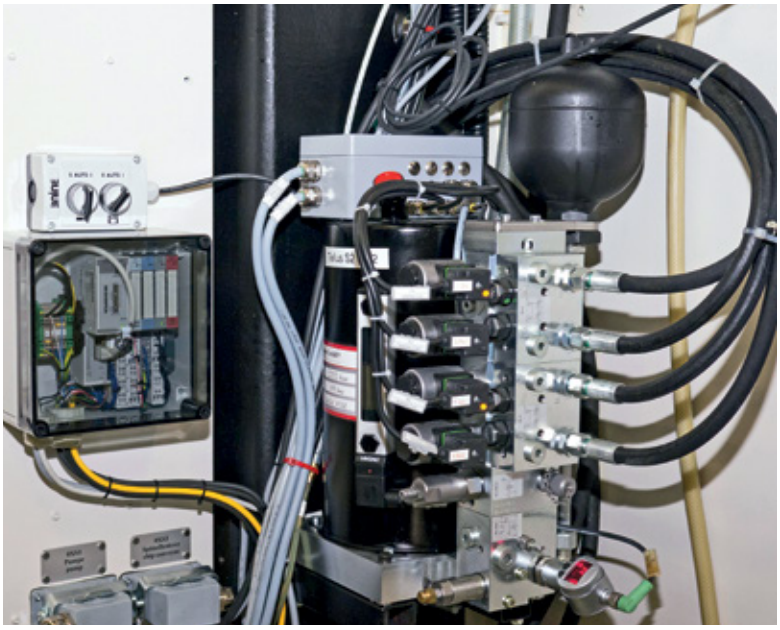
In Germany, RobMation offers 24-hour support. This means that we rectify any faults onsite within this time. This does not happen very often, however, we naturally always keep every components used for these cases in stock. That's why we like to use components that we can use flexibly and for which we can just keep one variant in stock."

Keeping wiring effort to a minimum

The BL20 I/O modules help to reduce the wiring effort for the system integrator with the installation. "When we wanted to connect a processing module to the Fanuc controller, we previously implemented this directly at the control cabinet via point-to-point connections. We wanted to avoid this effort and also use Ethernet solutions here in future."

As multiprotocol modules, the devices can also be used next to the machines with Profinet controllers on Ethernet/IP systems or in Modbus TCP networks. This therefore enables RobMation to use an I/O system to replace the point-to-point connections in three possible application fields and connect it via Ethernet systems.

Besides this plant, the engineers in Baesweiler developed proprietary metal shavings conveyors which remove coarse shavings from the KSS coolant used on the individual machines. These shavings are the only waste that is produced in the central processing plant. The customer no longer has to dispose of any contaminated KSS coolant since this stays permanently in the circuit. The company developed a suitable cooling lubricant specially for this.



The four machining centers are each provided with these switch boxes with BL20 gateways, to which the sensors and actuators are locally connected

Reducing costs, increasing productivity

Besides the consumption of KSS coolant, operating costs are also reduced, since employees no longer have to spend time checking and refilling. However, the uncompromising constantly high product quality is much more significant, since variations in quality caused by KSS coolant with different temperatures or contaminated lubricant are prevented. The productivity and reliability of the machines is increased.

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Shutting It

Valve specialist VAG has further developed its HYsec hydraulic brake and lift units – Turck's TBEN-L multiprotocol modules with a field logic controller and the TX513 HMI/PLC were used here to considerably reduce the installation effort required and optimize operation – even via remote maintenance

Water is one of the most important commodities of our planet. Its protection and treatment through water works, pumping stations and sewage plants is therefore all the more critical, and is something that valve manufacturer VAG fully understands. The company's range of products includes gate valves, butterfly valves, Howell-Bunger® discharge valves and many other valve types. Several users in the water management sector rely on VAG. The traditional company was founded in 1872 and has continuously grown since then. Today, the valve and fittings specialist is a solution supplier focusing on the latest manufacturing technology in water and drainage systems, in industry, in power stations and also in dams. They are therefore always looking out for new solutions for the future requirements of customers.

VAG also achieved this kind of improvement in the connection and operation capabilities of its HYsec hydraulic brake and lift unit. This basically has the function of a butterfly valve and thus guarantees the fast opening and closing of the pipe. The unit consists of three main components: the hydraulic power unit or pump, the hydraulic cylinder and the weight. Depending on the design, the hydraulic unit has its own or an externally controlled oil circuit.

HYsec is used in the hydropower sectors, for example in dams and turbine power stations, where they are used to protect the pipelines. If a pipe bursts,

Premier at the IFAT fair: The enhanced hydraulic brake and lift unit from VAG is now considerably easier to install and operate

for example, a flow sensor measures the changed conditions in the pipe and sends a signal to the controller of the HYsec. The hydraulic power unit then no longer pumps oil into the hydraulic cylinder, which therefore depressurizes the plant. The hydraulic drop weight trips and closes the pipe to prevent the further outflow of water. Once the pipe burst is rectified, the pressure in the HYsec increases and the pump once more supplies the hydraulic cylinder with hydraulic fluid. This in turn lifts the drop weight, the valve opens and the water can flow again.

Control cabinet needs too many cables

The HYsec was previously controlled via a control cabinet which required a large amount of cabling. Many customers wanted to be able to connect the sensors required for their plants via a terminal box. This involved the routing of additional copper cables from the terminal box to the control panel or to the next control cabinet. Depending on the size of the unit, between 18 to 30 cables were required per HYsec. Added to this was the fact that this system was not intelligent; the hydraulic brake and lift unit could not operate without an additional controller. "We always had a problem with the large number of cables. Customers also came to us and described how they had to route so many cables up to the HYsec. This was where we wanted to find a solution," Patrick Schenk, automation engineer at VAG explains the situation.

In order to reduce the mass of cables and achieve a more intelligent overall design, VAG looked for alternative control options. These needed to not only reduce the number of cables required, but also provide the ability in future to control several hydraulic brake and lift units via an HMI (human machine interface). Previously, each HYsec required its own HMI, which was not only difficult to operate but was also considerably more expensive than the new solution.

TBEN-L block I/O module provides the answer

VAG found the solution in Turck's TBEN-L multiprotocol module. The block I/O module with IP67 protection can be fitted directly on the HYsec, and thanks to the ARGEE integrated web-based programming environment, does not require any additional controller. This means that the customer no longer requires any more control cabinets, which considerably reduces the number of cables needed. The operator can also control several hydraulic brake and lift units simultaneously via a single controller and Turck's TBEN-L.

Each HYsec here is provided with a TBEN-L module, which is connected to the central controller via a single Profinet Ethernet cable. This saves money and time, while enabling the customer to control all HYsecs with one single controller. Another benefit is the compatibility of the TBEN-L multiprotocol module with controllers of other manufacturers via Profinet, EtherNet/IP or Modbus TCP. "Many customers use Siemens controllers. The ability of Turck's TBEN-L to be connected to a Siemens controller is thus a tremendous benefit," Schenk explains the decision to choose Turck.

Turck's intelligent TBEN-L5-16DXP I/O module with ARGEE field logic controller

The TBEN-L5-16DXP has 16 universal digital channels that can be used flexibly as inputs or outputs. The multiprotocol device automatically detects the protocol of the plant at startup. This means that any additional device programming by the operator is unnecessary.

Easy programming with ARGEE

The ARGEE integrated programming software is a web-based programming environment that enables PLC functions to be programmed directly on the modules. In this way, simple control functions can be outsourced to the I/O modules, thus saving the resources of the central controller and the load on bus communication. The ARGEE programming environment is a simple web application. The user just requires a device with a web browser. Simple requirements – as also in this case – can be implemented fully autonomously on the block I/O modules.

QUICK READ

The use of hydraulic brake and lift units previously required a large number of cables and control cabinets. Valve manufacturer VAG now has a single cable solution in the program that is easy to install. Turck's TBEN-L multiprotocol I/O module is mounted for this directly on the hydraulic brake and lift unit, thus saving the cables and control cabinets required. Thanks to the ARGEE integrated programming environment, an additional controller is also no longer required. A web server even enables remote maintenance of the plant in future.

"I had to get acquainted with ARGEE initially because it was completely new for me. However, once I had understood how it works, it was easy to use," Schenk describes his experience. "Ultimately you just have to think a little about what you want the program to do, and it can be completed within a few days. This is relatively straightforward and ends up with an intelligent valve that is ready to use. The customer just has to install it, plug in the power supply connector and it's up and running."

ARGEE enables the customer to program the device quickly to specific requirements, such as closing times and pressures. In this way, any system can be adapted to customer requirements quickly and simply so that the customer just has to connect it to the grid and switch it on.

Visualization via TX513-HMI

The processes and error messages are visualized via Turck's TX513 HMI. The human machine interface combines control, operating and monitoring functions in a Codesys V3 PLC with integrated visualization to form a fully-fledged control unit. Thanks to the number and flexibility of integrated interfaces, as well as the master and slave functions provided, the TX513 can communicate with any field devices or higher-level controllers. Each TX500 HMI therefore comes with a Profinet controller, EtherNet/IP scanner and a Modbus TCP as well as Modbus RTU master. The HMIs can also be run as slaves in both Modbus protocols.

When used in a hydropower station, the interaction between TBEN-L and TX513 would look something like this: If the flow speed inside the pipe increases or decreases, the TBEN-L provides the appropriate response and the event is visualized on the TX513. The flow speed increases in the event of a pipe burst. The hydraulic brake and lift unit has to be tripped in order to prevent damage. Sensors in the pipe register the change and pass the signal directly on to the TBEN-L module. The I/O module sends a signal to the HYsec so that the drop weight closes the hydraulic brake and lift unit. A"Attention: pipe burst alarm" message appears on the HMI, in response to which the operator can also take action. This also enables the user to control the individual HYsecs individually or together at the same time.

The TBEN-L I/O module and the TX513 HMI control and visualize the processes of the HYsec

Remote maintenance possible via web

The use of ARGEE and Codesys WebVisu also makes it possible in future to implement remote maintenance via a web server. Customers thus receive a signal directly on their computers in the control center, even if the hydropower station is located far away from the town. In the event of a pipe burst, the operator can take action immediately and switch off the water pipes remotely. "Remote maintenance via a web server is one of the main topics for the future that I consider to be a real benefit," Schenk explains.

Outlook

The plant with hydraulic brake and lift units can be given even greater intelligence through the use of different sensors. All the data collected from the flow and temperature sensors can thus be sent directly to the TBEN-L and visualized on the HMI. Turck offers a wide range of sensors for these kinds of applications. In combination with a cloud from VAG, the customer is provided with real-time data on the plant. "This simplifies the handling of the pipes enormously," Schenk sums up in conclusion.

»Many customers use Siemens controllers. The ability of Turck's TBEN-L to be connected to a Siemens controller is thus a tremendous benefit.«

Patrick Schenk | VAG GmbH

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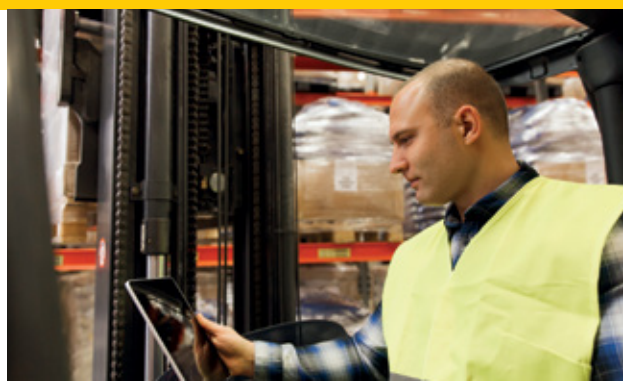

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Turck's inductive Li linear position sensor with IO-Link is robust enough for the severe environmental conditions at the rolling machine and is a match even for dust, vibration or electromagnetic interference

Pipe Clear

When Taprogge modernized its mixing plant for rubber cleaning balls, it used robust sensor and I/O solutions from Turck as a basis

Power stations use them, industry needs them and even the air conditioning technology in residential and office buildings cannot run without them. We are talking about water circuits, which always have to run reliably, especially in cooling plants. Taprogge, based in Wetter on the Ruhr, plays a decisive part in the reliability of many cooling plants. The company has been optimizing water circuits in industry, refrigeration technology, sea desalination plants or in power stations since 1953. Today Taprogge operates as a system supplier in the field of cleaning systems for water circuits and by its own account leads this market worldwide. The company's cleaning balls play a critical role in its cleaning plants.

The balls are used, for example, in cooling water condensers, where they clean the tubes of closed cooling circuits. Here they flow with the water through the pipes and thus remove dirt and deposits. The cleaning balls basically consist of natural rubber but vary according to the application area. Balls for use in severely contaminated water are surrounded by a layer of corundum, which also loosens harder deposits. The size of the balls also varies. The smallest have a diameter of 14 millimeters and the largest 48 millimeters. Depending on the degree of contamination, the water speed, pipe material and several other factors, Taprogge chooses the most suitable balls for its plants and customers. After the balls' period of use for a specific application, they must be replaced by the operator.

Retrofit – right through to the decentralized system

At the beginning of the multi-stage manufacturing process, the system brings together different components from different silos and mixes them. For this it had still been using until recently a central controller set up from the eighties. To further meet its own requirements for efficient production, Taprogge carried out a retrofit of its mixing plant for rubber cleaning balls at its main plant in Wetter an der Ruhr. The central architecture of the controller was to be replaced with a modern decentralized system, which meets current reliability, documentation and transparency requirements.

Everything from a single source

The planning and implementation of the retrofit was carried out by system integrators Gisa Automation from Wuppertal, in cooperation with Griebel Hydraulics and Pneumatics, a company based in Plettenberg. “The subject of retrofits has become increasingly more important for us in recent years,” says Klaus Stocker, who was in charge of the project for Griebel. “We found Gisa Automation, with whom we closely cooperated, to be the right project partner for these projects.” Gisa Automation is one of Turck's official

QUICK READ

The product range of cleaning plant manufacturer Taprogge in Wetter an der Ruhr, Germany, includes balls made of natural rubber for cleaning pipes in water circuits. As part of a retrofit, system integrators Gisa Automation modernized the entire mixing plant with ultracompact I/O modules, robust linear position sensors, indicators and connection technology from Turck. Today the plant now has a decentralized I/O system with stations that can be assigned parameters and analyzed easily via integrated web servers.

The cleaning balls made from natural rubber vary in design according to their intended application: They range in diameter from 14 to 48 millimeters

system partners and was therefore able to introduce the relevant know-how about Turck's portfolio in the project. Not only was Gisa impressed due to its knowledge of Turck products, but Taprogge also agreed with the plan. "We had already had Turck products in the company before the retrofit, so that we already knew them to be solid products," explains Ralf Dietrich, department manager for maintenance at Taprogge, "I knew that Turck offers sensible products."

The mixing plant consists of a weighing station and a roller machine that mixes and rolls a homogeneous, expandable compound from the raw rubber material. Another plant then processes the rubber compound into balls. Weighing and rolling are the key production steps. If faults occur here, they can no longer be corrected in the subsequent processes. Precise and clean work is therefore essential. Gisa Automation and Griebel used Turck's decentralized I/O modules on the weighing stations. "We used Turck because it is a reliable partner, both in terms of its technology as well as its people," explains Arnd Sänger, managing partner at Gisa Automation.

IO-Link linear position sensors measure the gap distance of rolling machines despite dust-laden environments and EMI

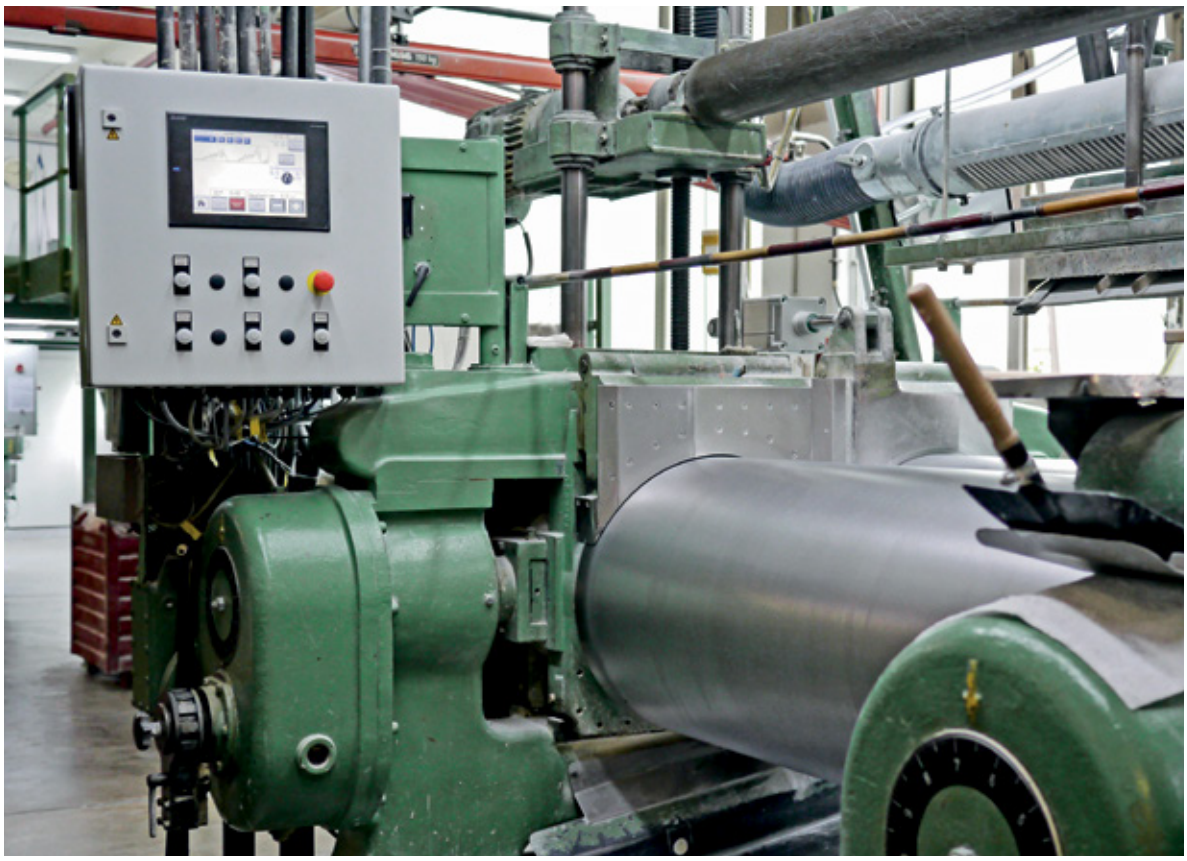
TBEN-S2-2Ccom for serial interfaces

The handheld scales for weighing the raw rubber mass are connected to the ultracompact IP67 TBEN-S2-2Com I/O modules for serial interfaces. These convert the Modbus RTU interface of the handheld scales to Modbus TCP. This also enables the devices with serial interfaces to be controlled by the central Mitsubishi PLC as the Modbus TCP master.

IP67 protection for field installations

Depending on the connection technology selected, the modules achieve degrees of protection to IP65/67 or even IP69K, and can therefore be used in the field directly on the machine. This shortens the wiring runs from the module to the devices in the field. Only one Ethernet cable and one power supply are run from the I/O module to the control cabinet. Both cables, for power and Ethernet, can be linked from module to module in a daisy chain. Ideally they only have to be routed once from the control cabinet to the field.

The programming required for the communication with Modbus RTU devices is kept to a minimum since a Modbus RTU server is already provided on the module. The TBEN-S2-2Com is the ideal link for integrating existing Modbus RTU stations and devices with other serial interfaces in modern industrial Ethernet networks. As multiprotocol devices, they also integrate I/Os into Profinet or Ethernet/IP networks in addition to Modbus TCP.



The rubber rolling machine can be controlled reliably via K30 indicators with integrated touch buttons fitted under the display

K30 touch buttons and indicators from Turck's optical sensor partners Banner Engineering are used to operate the handheld scales. At the terminal of the handheld scales the operator sees the quantities that have to be weighed for a product. The weighed quantity is confirmed via the integrated touch button of a K30 indicator. The scales output the weighed value via the RS232 interface. The serial interface was originally integrated in order to connect a printer. The TBEN-S2-2Com converts the signal to Modbus TCP and sends it to the PLC. If the operator has weighed too much or too little product, the controller checks whether the value is within the tolerance range. If this is not the case, an error message is shown on the terminal and the operator is required to correct it.

Besides the range of interfaces provided, the simple commissioning of the decentralized I/O modules made a good impression. "Turck's I/O modules enable a lot of parameters to be set via web functions. This is precisely what we need. I no longer need to put my ancient PLC in the corner for 15 years in order possibly to reset some parameters at a later time," Sänger explains the benefits of Turck's I/O modules.

K30 touch buttons offer guidance through the process

The automated weighing stations are also equipped with K30 indicators and TBEN-S2-2Com. At these stations the silos automatically weigh the quantity of their particular product, which the employee then adds to the rubber compound. A klaxon is activated and the appropriate K30 starts flashing if, for example, there is no container underneath a silo. A similar response is activated if too much product is weighed. The K30s enable the operator to know immediately where the fault is, rectify it directly at the appropriate point, and then confirm it via the integrated pushbutton of the light. Due to its IP67 protection, the K30 is ideally suited for use in the field. Added to this is the fact that each indicator light can be controlled individually, so that the relevant work area can be identified precisely.

Simple connection without Y splitters

The connection of the K30 lights at the TBEN-S2-8DXP deployed here is particularly easy. As the modules are provided with two universal DXP ports, it is only necessary to use one of these DXP ports to connect the actuator (indicator) as well as the sensor (capacitive touch button). These kinds of combined button lights usually have to be connected with a Y splitter to two M12 female connectors on an I/O module. However, on the TBEN-S2-8DXP one male and one female connector are enough. The module uses the port as an input and output depending on the requirements of the connected indicator.

The indicators with an integrated touch button are also fitted at the operator panel of the roller machine. In order to process the rubber, the roller needs different gap widths according to the condition of the material, which the operator must be able to set quickly and reliably. For this reason, Sänger decided not to implement the operation control with a touch pad. The risk of the operator's hand slipping on the touch pad and activating the wrong command is too

great. The K30 indicators are big enough to almost fully exclude the possibility of an operating error. The touch buttons can even be operated without any problems when wearing thick gloves. To simplify the learning process, Gisa arranged the touch buttons according to the wishes and requirements of the employees.

IO-Link improves the EMC of the gap measurement

Two inductive linear position sensors with an IO-Link interface are fitted next to the roller on both sides. These continuously measure the gap between the two rollers. The measuring data is permanently archived by software for quality assurance. Turck's inductive Li position sensors are also ideal for use in the severe and dust-laden environmental conditions at the roller machine thanks to their protection to IP67. Electromagnetic interference from the motor does not impair the function of the sensors. "A 140 kW DC motor is installed at the roller machine, which means that at this particular location IO-Link is the more reliable system. Handling is also better here," Sänger explains the decision to use the linear position sensor with an IO-Link interface.

The Li sensors are connected to a TBEN-S2-4IOL, which operates as an IO-Link master and sends the data via Modbus TCP to the controller for the roller gap measuring system. Compared to the previous analog sensor system, the inductive operating principle as well as the digital transmission via IO-Link increase the reliability of the gap measuring system.

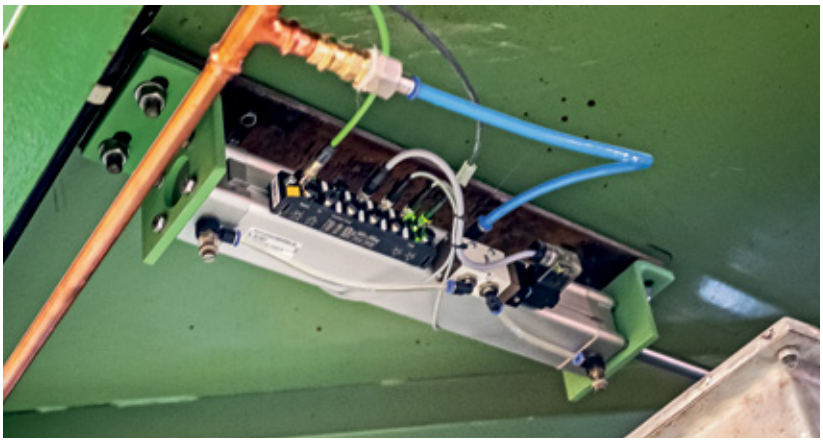
Digital information is also processed in the power distribution cabinets of the plant. Turck's BL20 I/O modules only process the digital signals of the contactors and the electrics in the switchboard. In the power distribution cabinet for the roller machine, they are still equipped with analog inputs in order process general roller parameters, such as roller output and voltage. Turck's BL20 gateways can also be used as protocol converters, such as from Ethernet to serial communication. The programmable variants can even control sections of the plant on their own. To do this, the customer programs his controller directly with Codesys directly on the BL20 gateway.

Conclusion

The retrofit project of the rubber production facility shows how it is possible, with the right integration know-how and intelligent automation technology, to modernize outdated systems to ensure efficient production and high quality standards. The mechanical systems of old plants are often still in good condition. It is the controller, drive, sensor and communication technology that have developed rapidly in recent years. The integrator also agrees. "Thanks to the retrofit, the plant has become more reliable and faster. Reliability has increased, and also the quality of the products has improved," Sänger sums up. Gisa Automation will continue to implement other projects with Turck products. "At Gisa Turck has been specified as the standard product for the entire decentralized I/O level," Sänger explains. Taprogge will also use automation solutions from Turck for the forthcoming retrofit of the other roller machines: "I think that the tried and tested products will definitely be used again," Dietrich announces.

Satisfied with the successful completion of the retrofit project: Ralf Dietrich (Taprogge), Arnd Sänger (Gisa Automation) and Klaus Stocker (Griebel) (from left)

Turck's BL20 I/O system takes care of the signal processing in the control cabinet



Turck's ultracompact TBEN-S2-8DXP I/O modules connect the automatic weighing stations to the controller via Modbus TCP

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Encoders on Safari

Chimelong Safari Park in China equips the grooved rollers of the cableway pylons and the gondolas of its cableway with Turck QR24 encoders for speed monitoring

Large, small, furry, bald – the wide diversity of animal life on our planet is varied and fascinating for many people. Watching wild animals in their natural environment has a special attraction for people. The Chimelong Safari Park in China has made use of this fascination. On foot, in a vehicle or from the air – the visitors of the safari park have different possibilities to see lemurs, elephants, giraffes etc. in their more or less natural environment. The 2.7 kilometer long cableway safari is the only one of its kind in Asia. The cableway was opened in the beginning of 2017 and the all-round glass design of its gondolas offers a virtually 720 degree view over the animal world.

The development of the cableway was carried out by the POMA Group, the French cableway manufacturers, who can look back on eighty years of company history. With over 8,000 systems installed and a turnover of 345 million euros in 2017, Poma is one of the world market leaders in the cableway business.

The Chimelong Safari Park required a cableway with removable gondolas that can comfortably hold eight people. The cableway needed three sections for stability and six stations, at which visitors could get on or off. The cableway also needed a speed monitoring system to ensure that no visitor gets stuck along the safari trail or moved along too quickly. As the Chinese weather is subject to severe changes – severe heat on one day and pouring rain the next – a system was needed that could withstand the harsh conditions of the Asian climate. It therefore has to withstand temperature fluctuations and must not be susceptible to humidity. Poma found the answer in Turck's QR24 inductive encoder.

A QR24 is located on a grooved roller for each gondola or cableway support

The QR24 encoder counts the rotations of the grooved rollers and sends the values to a higher level controller

Turck's QR24 rotary encoder operates fully without contact

Robust encoder for severe environments

The non-contact design of the QR24 encoder and its fully encapsulated design is particularly suitable for operation in severe environments, since its operation is not impaired by vibration, humidity or contamination. Thanks to its protection to IP67/IP69K, the incremental rotary encoder is ideal for use in cableway construction. The inductive measuring principle enables the design of positioning element and sensing unit to be combined in a fully enclosed and encapsulated unit. The non-contact measuring principle of the QR24-INCR means that it is completely maintenance-free and wear-free. These features are of particularly important for application such as a cableway, in which the safety of humans is directly affected.

The parameters of the QR24 encoder can be set with an Easy-teach function or PACTware. The tripping of the burst function, the changing of rotation direction or the setting of the zero pulse could not be simpler. However, if something was incorrectly set, the original settings can be restored via a factory reset. Even the pulse rates can be set to individual requirements. Any resolution between 1 and 5000 pulses per rotation is possible.

Full control

Poma uses the QR24 encoders in cableway construction both on the grooved rollers of the intermediate cableway support pylons as well as on the individual gondolas. Each cableway support or gondola on a grooved roller is provided with one QR24 encoder. The QR24 counts the rotations of the individual grooved rollers and sends the values to a higher-level controller. The controller finally calculates from the speed of the rollers the speed of the carrier cable and thus the individual gondolas. If a gondola moves too quickly or too slowly, the controller registers the deviation from the normal data. A complete standstill of the installation or individual gondolas can be registered in this way. If a gondola gets stuck on the safari route, the park team is notified and can take the appropriate action immediately.

Efficient and cost saving

Thanks to its non-contact measuring principle and the resulting maintenance-free and wear-free operation, Turck's QR24 encoder is first choice for future projects with the Poma Group. The Chimelong Safari Park values the quality of the Turck products. They meet the requirements of the park precisely. Their stable and contactless position measuring and monitoring system is a solid basis for future automation systems. Twice the efficiency in half the time and at half the costs have impressed the people in charge at the Chimelong Safari Park.

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QUICK READ

Chimelong Safari Park in China opened its new cableway early in 2017. To monitor the speed of the support cable, cableway manufacturer Poma Group required a system for use in the severe environmental conditions in Asia. Poma found the solution in Turck's QR24 incremental rotary encoder. With protection to IP67/IP69K, it is ideally suited for use in severe environmental conditions. Its contactless measuring principle makes the encoder fully maintenance-free and wear-free.

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19.02. – 21.02.2019	Logimat	Stuttgart, Germany
19.03. – 22.03.2019	Amper	Brno, Czech Republic
26.03. – 29.03.2019	Automaticon	Warsaw, Poland
27.03. – 29.03.2019	Smart Factory + Automation World	Seoul, South Korea
01.04. – 05.04.2019	Hannover Messe	Hanover, Germany
02.04 . – 04.04.2019	RFID live	Phoenix, USA
08.04. – 11.04.2019	Pro Mat	Chicago, USA
09.04. – 10.04.2019	ISA/AEC	Calgary, Canada
09.04. – 11.04.2019	International Industry Fair	Celje, Slovenia
15.04. – 18.04.2019	Oil & Gas	Moscow, Russia
07.05. – 09.05.2019	Fabtech	Monterrey, Mexico
14.05. – 16.05.2019	Smart Automation	Linz, Austria
14.05. – 17.05.2019	Industry Days	Budapest, Hungaria
15.05. – 18.05.2019	Metaltech-Automex	Kuala Lumpur, Malaysia
21.05. – 24.05.2019	Elosys	Nitra, Slovakia
28.05. – 30.05.2019	SPS IPC Drives Italia	Parma, Italy
04.06. – 06.06.2019	Africa Automation Fair	Johannesburg, South Africa
11.06. – 13.06.2019	Expo Pack	Guadalajara, Mexico
18.06. – 21.06.2019	ROSUpack	Moscow, Russia
09.07. – 11.07.2019	Semicon	San Francisco, USA
01.10. – 03.10.2019	HI Industri Herning	Herning, Denmark
22.10. – 25.10.2019	Congreso Internacional Minero	Acapulco, Mexico
11.11. – 14.11.2019	Fabtech	Chicago, USA
26.11. – 28.11.2019	SPS	Nuremberg, Germany

The Net

On the Turck website and product database you will find all the relevant information about Turck's products and technologies, systems and industry solutions – from success stories to data sheets right through to the download of CAD data.

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Sites

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