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The Magazine for Customers of the Turck Group



RFID Cooperation

"We have purchased some advanced UHF know-how," says Ulrich Turck **P. 12**



A Seamless Package

Turck's extended excom remote I/O family allows installations from the safe area to zone 1 **P. 14**



Precise Presses

Weima optimizes its presses with inductive LI linear position sensors from Turck **P. 18**



Focused on Solutions

Turck mechatec offers ready to connect complete solutions to meet customer requirements – from the control cabinet to the motor

Investing in the Future



In the past year, Turck has made some considerable investments in order to offer you, dear readers, even better support in the future as a solution-oriented partner for your automation tasks. One example of this is the UHF-RFID technology cooperation with deister electronic. In order to provide you with UHF solutions for long range sensing in the near future, we have invested in the advanced UHF know-how of our contract partners, which we can now utilize and further develop for industrial automation. We are presenting the first result of this collaborative work at the Hannover Messe and on page 5.

The fact that such a result is already available so quickly is due to another investment we have made: in 2011 Turck acquired Eaton Automation Holding's 50 percent interest in the joint venture company MT ElektroniX in Detmold. As sole owner of the company now called Turck Electronics, we can now utilize the full capacity of employees for RFID and fieldbus developments.

A new main focus on the agenda is the expansion of our activities in the field of connection technology – a field in which Turck has been market leader for many years in the world's largest automation market in the USA. With this experience on board, we are now presenting to you in Germany and the rest of the world the first of the latest connection technology concepts we have developed, and with which we are reinforcing our reputation as solution providers.

Turck has also invested on the production side: a 15 million euro production building will soon be put into operation at our Halver site. This will expand capacity by around 11,000 square meters to 26,000 square meters of production area in total. Turck has also invested a further 6 million US dollars in new production buildings in Minneapolis. Our solution-oriented approach is supported by the range of services offered by Turck mechatec. This Turck subsidiary complements our offering with the possibility of implementing many individual customer requirements, and for example supplying assembled control cabinets ready for connection. A closer look at the company is provided on page 8.

You can clearly see that Turck has set many things in motion from which you as a customer will benefit worldwide – now and in the near future. By the way, since 2011 we have also added our own national subsidiaries in the booming automation markets of Brazil and Turkey. We will consistently pursue and further develop this strategy in the future – together with you and for you.

Yours sincerely,

Christian Wolf, Managing Director

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Zierer uses inductive linear position sensors from Turck to sense the horizontal position of the gondola arms on the Flying Fish roundabout ride. **Page 22**



Stonemaker is supplying worldwide and assembling on site mobile stone factories equipped with Turck fieldbus and connection technology. **Page 26**



An automotive manufacturer in China is using Turck’s BL ident RFID system in a line to correctly coordinate the production of different engine versions. **Page 30**

New Online Services



► With a new service, Turck is offering customers and prospects a quick way of accessing detailed product information on the Internet. For this purpose, the company is printing so-called QR codes in more and more catalogs and brochures that allow a direct connection to the product database. This provides all technical data as well as manuals or CAD data for the Turck product range. The user simply has to scan in the QR code in order to reach the database directly. While a suitable reader App makes the Internet connection for smartphones, www.turck.de/qr now provides a similar function for webcam users on the PC. The intelligent link of QR code, webcam and the Turck website guides the visitor directly to the product database. The solution was implemented jointly with the Augsburg software manufacturer Cadenas, with whom Turck has for a long time been successfully running a CAD parts catalog for the complete product range. This catalog offers users the possibility to download three-dimensional CAD data in around 80 different formats – at no cost at all and without any registration necessary.

Info

You can find more information on the reports or product presentations in more@TURCK under www.turck.com. Simply enter the Webcode that you find at the top of each article in the search field. The following article page takes you directly to the product database or you can download or send the article as a PDF.

Miniature Linear Position Sensors

► A new miniature linear position sensor with a 300 mm measuring range has been added to Turck's compact **LI-Q17 series position sensors**. The sensors operate on the resonant circuit measuring principle, in which the position is not detected with a magnetic positioning element but inductively via an oscillating system created by a capacitor and coil. The robust LI-Q17 in the fully encapsulated plastic housing is now available in five sizes with measuring ranges of 50, 100, 150, 200 and 300 mm for temperature ranges from -40 to +70 °C. The models come either with an optional standard analog output (0...10 V, 4...20 mA) or with a 0.5...4.5 V output. In spite of their compact mounting form, Turck's new sensor series have extremely small blind zones of

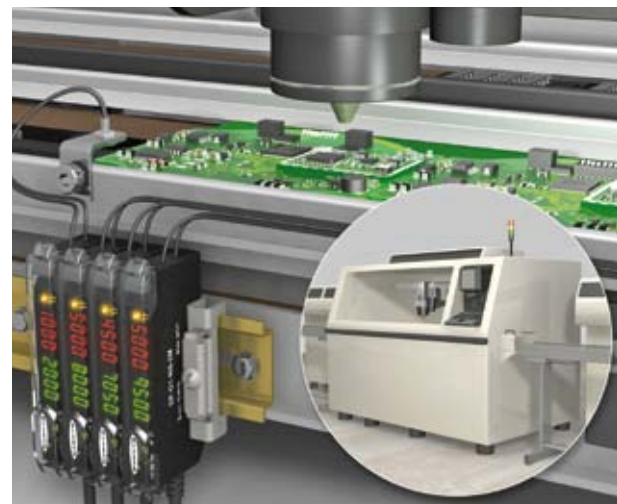


10 mm at the connection end and 22 mm at the head end. The connection is implemented with a pigtail with 30 cm cable and M12 connector or with 2 m of open connection cable. Thanks to its intelligent mounting concept, the user can install and start the LI-Q17 with the supplied standard accessories quickly and simply – in all mounting situations. Stable metal clips that are simply snap fitted in the sensor housing enable either vertical or horizontal mounting.

Dual Display Fiber Amplifier

► A dual display fiber optic amplifier that can be easily programmed for a wide range of applications and conditions has been introduced by Turck's partner Banner Engineering. The new **DF-G1**

Expert has two easy-to-read digital displays showing signal level and threshold simultaneously for simple operation and pinpoint accuracy. Its expert "teach" and "set" methods allow users to modify response time, signal level and sensitivity. This flexibility allows the unit to support many sensing needs, including low contrast situations, small object detection and parts in place verification. The 10 mm wide amplifier is designed for use on machines performing part detection in packaging; electronic assembly; pill, caplet and syringe counting for pharmaceutical and medical device manufacturers; and high speed edge detection for web processes and material handling. It assures accurate low contrast detection of small objects and supports machines with high sensing point density, where the fiber allows accurate detection in confined locations.





BL20 Gateways for Profinet IRT and Ethercat

► Turck is expanding its fieldbus portfolio with new Economy gateways for connecting the BL20 I/O system to Profinet and Ethercat networks. The **BL20-E-GW-PN** gateway allows hard real-time communication in compliance with the Profinet IRT (Isosynchronous Real-time Ethernet) specification. The gateway comes with extensive diagnostic and maintenance functions like LLDP for automatic detection of neighboring stations. The Ethercat gateway **BL20-E-GW-EC** ensures fast data transfer rates for real-time applications, such as is required for axis synchronization or for time-critical positioning tasks in the packaging industry. The new gateway now enables Turck's BL ident system to be integrated for the first time into Ethercat networks. Together with the gateways for Modbus TCP and Ethernet/IP, there are BL20 fieldbus interfaces available for various Ethernet bus protocols. The gateways with a width of only 33 millimeters come with an onboard power supply unit, a switch as well as two RJ45 female connectors, and thus significantly reduce installation requirements.

Compact UHF Read/Write Head

► The **TN865-Q175L200-H1147** compact UHF read/write head is the new member of Turck's RFID product portfolio. The active read/write head supports the ISO 18000-6C and EPCglobal Gen 2 standards, and combines antenna and electronics in a robust IP67 aluminum housing with the dimensions 175 x 200 x 60 mm. It can thus be physically integrated optimally in existing production lines. The TN865 is the first read/write head jointly developed within the scope of the technology partnership between deister electronic and Turck. From the outset, an application optimized development for use in industrial production and logistics processes was the prime objective. If required, the UHF read/write head can be operated on Turck's modular BL ident RFID system simultaneously with HF components. In combination with robust UHF tags, which also allow direct mounting on metal, use at high temperatures up to 240 °C or use in autoclaves, the UHF technology with its large sensing distances can now also be used in areas in which it was previously not possible.



Turck Receives AEO-C Certificate



► The Main Customs Office (Duisburg, Germany) has issued Turck with an **AEO-C certificate** (Authorized Economic Operator – Customs), which certifies the safe and reliable handling of international business. Turck customers can thus now benefit from faster and more reliable delivery processes across EU borders. As a certified AEO, Turck can now make use of simplified customs procedures and ship deliveries faster, thanks to the fewer inspections of goods and papers required. The status of an approved economic operator indicates to the customer that they are dealing with a reliable and trustworthy trading partner.

New Headquarters in Austria

► **Turck Austria** has moved into new premises in the Graumannsgasse in Vienna. The move was necessary due to the continuous growth and further development of the Austrian Turck subsidiary. The new address is: Graumannsgasse 7/A 5-1 in 1150 Vienna. Telephone and email addresses remain unchanged. "The new subsidiary offers more warehouse space for our growing business and above all larger and more modern office space," **Stephan Auerböck**, sales manager and authorized company representative of Turck Austria, describes the move. "Since we are aiming to keep our support at a high standard and delivery times as short as possible, we had no alternative but to move."



Redundant Power Supply

► At the Achema fair, Turck will be presenting a redundant power supply concept for its **BL20 I/O system**, which considerably expands its application range. This enables redundant power supply modules to be incorporated into the IP20 I/O system without any additional effort, thus ensuring greater system availability. Should a module or its power supply fail, the redundant module will automatically take over the supply of power to the connected stations. An integrated diagnostic function indicates the failure via LEDs and diagnostic messages to the controller so that the module can be replaced immediately in order to restore redundancy. Depending on the specific application, as many redundant power supply module pairs can be integrated for each station as required. The first module pair supplies the fieldbus gateway and the first I/O modules. If the maximum power supply output is reached, another pair of redundant power supply modules can be installed which supplies the I/O modules installed to the right. The so-called Bus Refreshing modules offer two voltages: 5 V and 24 V for the I/Os.



Training



► Turck now offers training courses about its products, technologies and systems for interested customers. The training will teach the customers how to implement and operate the solutions from Turck fast and reliably. More information and registration online: www.turck.de/training

► Webcode **more11210e**

Flexible Angle Sensors

► Turck has added new functions to its range of **RI inductive angle sensors**. From now on, users can teach the RI sensors directly at the device. Not only is it possible to call up hard programmed angle ranges, but start and end points can also be defined for the sensors as required. Furthermore, the rotation direction can also be selected as required. The sensors were developed for use in mobile devices in accordance with the e1 specification. On the RI sensors, the angle position is not measured with a magnetic positioning element, but by means of an RLC circuit. This sensor is completely immune to magnetic fields, such as those of large motors. The RI sensors have a measuring range of 360° with an accuracy of 0.15 percent of full scale. The separate design of sensor unit and positioning element, as well as an offset compensation of ±4 mm guarantee the easy installation and safe operation of the sensors. The positioning element can be fitted on solid or hollow shafts as required. The contactless principle reliably compensates bearing tolerances of the applications as well as vibrations caused by shaft eccentricity. This guarantees a high linearity. The sensor can also be adapted at the output to external requirements: 0...10 V, 4...20 mA, 0.5...4.5 V and SSI interfaces are available.



Fast Startup Block I/O Module

► Turck is now offering a new Ethernet/IP-based I/O module for applications requiring extremely short startup times. The compact **FGEN block modules** require less than 100 milliseconds up to full operational readiness and are therefore faster to start up than other Ethernet/IP stations. The new FGEN module is ideal for use on robot tool changer systems in the automotive industry. Thanks to their compact design and protection to IP67, the module can be fitted everywhere without any additional protection required. The fast startup I/O modules can also be installed in



linear topologies thanks to their integrated switches. Turck is offering the modules with four different terminal configurations: 16 freely configurable inputs or outputs, 16 inputs or 16 outputs as well as a version with 8 inputs and 8 outputs each. All variants are not only available for Ethernet/IP, but also for Modbus.

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Focused on Solutions

Turck mechatec offers ready to connect complete solutions to meet customer requirements – from the control cabinet to the motor

Customer proximity and solution orientation are buzz words that the marketing departments of many companies particularly like to use. However, when customers then have actual requirements that cannot be implemented with standard solutions, the wheat is soon separated from the chaff.

“We see ourselves as solution partners for our customers, and our customers can also measure us against this claim,” assures Oliver Merget, vice president business unit Automation Systems at Turck. “In spite of the fact that we have more than 15,000 products in our portfo-

lio, we frequently have inquiries for individual special solutions, either as specific further developments of Turck products or as ready to connect complete solutions.” In order to implement the most diverse customer requirements, Turck has developed accordingly over recent years in terms of its infrastructure and personnel. “Depending on the inquiry, specialists either support the sales force in advising and implementing customized further developments, or we help our customers in their task by providing them, for example, with assembled control cabinets or boxes,” Merget explains.

Author

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Production manager Rainer Winck and employee Dirk Vennemann (right) can draw on a full range of resources: Although mechatec operates fully independently, it can draw on all Turck resources at any time



Turck founded Turck mechatec GmbH ten years ago for this very purpose. The subsidiary based in Mülheim an der Ruhr, Germany, is linked closely to the Turck sales organization and the product management. "The direct contact with product management and sales is vital for the order-based design of individual customer solutions," says Merget, who is also responsible for sales and technology at Turck mechatec. "From here we can access all company resources and can thus optimally implement orders in direct exchange with customers and mechatec employees."

A regular feature in the mechatec portfolio is the ready to connect assembly of the excom remote I/O station. "As virtually all excom orders are supplied in switch boxes, it is also possible to equip them straight away with the modules defined by the customer, whether they are in stainless steel housings with or without an inspection window. The customer receives their individually assembled remote I/O solution and



Christopher Rühl fits the excom I/O system to customer requirements



only has to mount and connect the stainless steel housing," explains Rudolf Wolany, responsible for project planning at mechatec.

Last year mechatec completed a typical order that involved several services for the Rheinisch-Westfälische Wasserwerke (RWW) in Mülheim. The water company wanted to monitor well covers using uprox inductive sensors, which had to be wirelessly connected to the PLC. With over one hundred wells to be monitored with uprox inductive sensors, the customer would have required a lot of time and personnel to fit the sensor, the wireless gateway, the battery and the antenna to every cover. Mechatec was closely involved in the project from the very first talks with the customer, so that it soon resulted in the Turck subsidiary supplying the stainless steel housings together with transmitter, battery, sensor and connected antenna already fitted. RWW just had to fit the boxes to the well covers.

"The mechatec business starts where the Turck business usually ends," production manager Rainer Winck comes straight to the point. "We complement the Turck offering and do everything to supply our customers with perfectly optimized solutions." On request, mechatec even carries out the installation and startup, as well as creating operating manuals or adapting software programs for operating mechatec solutions. With its own purchasing department and inventory,

Quick Read

As an automation partner Turck doesn't just limit its offer to customers to its extensive portfolio of over 15,000 products. If the customer wishes, he receives bespoke, ready to install complete solutions with his specified components. The offer ranges from the excom remote I/O systems in the stainless steel housing, to customized cable markers right through to complete control cabinets. Everything is planned and implemented by the Turck subsidiary mechatec.



Every order is discussed in the team (from left): Project manager Rudolf Wolany, production manager Rainer Winck and Oliver Merget, head of sales and technology at Turck mechatec

mechatec is completely independent of the big parent company, which ensures a considerable level of flexibility.

Increasingly independent projects

The mechatec business started with the finishing and customization of Turck products. Today the company achieves a major portion of its sales through projects that are not linked to Turck orders. For example, in control cabinet construction: "We offer conventional control cabinets and additional adaptations that are also independent of Turck products. This portion of the business now makes up as much as half our total sales," explains Wolany, who is responsible for sales tasks as well as his activities as project manager. He is supported in this by the complete Turck sales force, which also always keeps the full range of mechatec services in mind when talking with customers.

The increasing sales outside of the Turck business should not disguise the fact that mechatec continues to be closely linked with Turck. This connection starts with the managing director, Ulrich Turck, who simultaneously holds the position of managing director of Hans Turck GmbH & Co. KG. It goes further with the

joint use of corporate buildings, warehouse logistics and building services. Mechatec even draws on the services of Turck software specialists when customized software has to be written. The connection with Turck strengthens mechatec and vice versa. Through the joint use of infrastructure and personnel, the subsidiary company can also handle major projects without any problems.

Some big names in the customer file of the Mülheim-based company also say much about the reliability and quality of its services: this includes three heavyweights of the German automotive industry, Daimler, Ford and VW, as well as Schering and BASF, two global players from the pharmaceutical/chemical sector. This list could be extended for other branches but many projects are subject to confidentiality agreements.

Mechatec is currently preparing 850 motors for AEG SVS Schweisstechnik, who in turn are supplying this to Daimler. The motors are being fitted with connectors to customer specifications and with standard Daimler cable markers, which are likewise produced and printed in Mülheim. Mechatec is also producing Piconet fieldbus I/O systems for Daimler. The employees fit the modules with special cables, cable markers, and with a specially produced junction box system, which mechatec installs in a metal housing and completely encapsulates in epoxy resin. "Daimler fits and plugs the finished units directly onto the robot, and that's it," says production manager Winck. Mechatec has been gradually fitting out the production robots of the automotive manufacturer with the Piconet I/O system for the past six years.

Joint future

Turck and mechatec continue to grow further. Although the subsidiary company has moved further away from the actual business of the parent company in some projects, it remains a young and important part of the Turck Group. Ultimately, with its flexibility, production know-how and speed, mechatec provides the automation specialist with additional tools to honor its promise: supplying the customer with the most efficient solution as possible for their requirements. ■



For RWW, mechatec made up over 100 ready to connect sensor/wireless systems



Indestructible: The customized I/O box is fully encapsulated and individually labeled by mechatec

Ulrich Turck sees “no other supplier that can offer such a perfectly matched and modular overall package, which it maintains permanently – all around the world”



“UHF Know-How Purchased”

Mathis Bayerdörfer, chief editor of the technical publication A&D, talked to Ulrich Turck about the reasons and details of the UHF collaboration with deister electronic

For Turck, RFID is nothing new. Why did you enter into this cooperation instead of developing UHF solutions yourselves?

It is true that Turck has had an established presence in the industrial automation sec-

tor for a long time with its HF RFID solutions. Our BL modular RFID system has been established in our target markets for years and is being continuously developed. However, in order to also meet the increasing demand for UHF read/write

heads promptly with developed solutions, we decided to make use of existing knowledge, and further develop this specifically for the needs of the automation sector. The word “promptly” is a key factor here. While we were naturally also capable of devel-

oping UHF, by the time we had obtained the level of know-how of our current partner, a long time would have passed, during which we would not have been able to offer our customers a complete UHF portfolio.

Why did you specifically choose this partner?

Currently there is hardly any other company that has a higher level of experience in the UHF sector than deister electronic. The company has established itself over many years as proven specialists in UHF technology, mainly in sectors other than the automation sector. In the field of industrial automation, Turck is successful with its HF technology. The product and sector expertise of both partners therefore complement each other ideally. We therefore signed a cooperation agreement which regulates the mutual technology transfer, and gives Turck the possibility to fully utilize the extensive UHF experience of deister electronic for its own developments in the automation sector and to market this worldwide.

What is the added value for deister electronic?

For both partners, this cooperation is a milestone in the development of the companies, from which customers will benefit directly. Apart from the monetary aspect, which I naturally don't wish to go into here, deister electronic benefits from the marketing of the technology in other sectors and above all from the global sales network of the TURCK Group. The company has gained in Turck a powerful sales and development partner, enabling deister electronic to access new sales markets worldwide and concentrate on further application fields. It will thus enable our customers to always find the right read/write heads for the task at hand, either in the proven HF or in the wide range UHF band, and for use anywhere in the world.

What does the cooperation agreement regulate exactly?

The cooperation and marketing agreement goes far beyond what is generally understood by cooperation. Turck has gained full unrestricted access to the developments, the know-how and the property rights of the deister UHF technology, and can use this at its own discretion in the field of automation technology.

"Utilize at its own discretion", what does that mean exactly?

If required, we can further develop the UHF technology selectively for our customers and even produce the devices ourselves. In order to implement this, it has been contractually stipulated that deister will intensively train Turck employees. The development and project departments of both cooperation partners are now working very closely together in the area defined by the contract. This means that the customer has in Turck a partner for RFID projects that not only offers extensive application and solution know-how in the HF and UHF range, but also a total package of top quality products for any sector in the market.

That's an impressive claim. What is the substance behind it?

The cooperation and marketing agreement enables Turck today to offer probably the most advanced system solution for RFID applications in production, logistics and many other industrial application fields. There is no other supplier that can offer such a perfectly matched and modular overall package, which it maintains permanently – all around the world. The industry and application knowledge of Turck, enhanced with the UHF know-how acquired from deister electronic, guarantee the fast and precise tailored implementation of demanding RFID solutions in the HF and UHF range. This is further enhanced not only by the range of existing housing types from our sensor range, into which we can also integrate the UHF technology from deister, but also the modular system concept that is based on our BL67 and BL20 I/O systems. This concept allows the direct integration into the automation infrastructure of the customer – even in parallel to non-RFID signals. The CoDeSys programmable fieldbus gateways even enable the implementation of total RFID communication in the field so that it is possible to only transfer the user data to the high-level controller.

Can you in closing give us an idea about the future developments of the RFID system?

As you can see, we are working continuously on the further development of BL ident. For example, we will be presenting different HF read/write heads at the Hanover Fair with a considerably increased range of up to one meter, as well as a new UHF read/write head, which is the first result of our joint development with deister electronic. We will be showing our developments in the UHF range in autumn at the SPS/IPC/Drives fair. ■



“Turck has gained full unrestricted access to the developments, the know-how and the property rights of the deister UHF technology, and can use this at its own discretion in the field of automation technology.”

Ulrich Turck



“This means that the customer has in Turck a partner for RFID projects that not only offers extensive application and solution know-how in the HF and UHF range, but also a total package of top quality products for any sector in the market.”

Ulrich Turck

Author



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A Seamless Package

Turck's extended excom remote I/O family allows complete fieldbus installations from the safe area to zone 1

When several fieldbus devices in a processing plant have to be connected to the distributed control system (DCS), the system planner basically has several alternatives: interface solutions, remote I/O solutions and exclusively fieldbus solutions. The classical method of signal transmission is point-to-point wiring, i. e. interface technology. This transfers the individual measuring signal from a measuring instrument in the field directly to the PLC. With point-to-bus wiring – also called remote I/O – the signals of the field

instrumentation are collected on an I/O station in the plant, converted to a digital protocol and forwarded to the control system via a bus cable. In this way, the DCS only requires a single communication interface instead of several analog or digital input and output cards.

The third variant is the bus-to-bus connection, i. e. complete fieldbus technology. In this variant, the appropriate field instrumentation is linked directly to the bus via the communication protocol, such as Profibus PA or Foundation Fieldbus. Each field device here

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The new member of the excom family offers a more compact module rack and new power supply units for use in zone 2

is an independent station on the bus, but must also be provided with its own fieldbus connection. This requirement is not possible for many installations since the topology is more complex compared to a remote I/O solution. Very often the signal density is too high for complete fieldbus solutions, or binary signals are required – such as from Namur sensors – in addition to analog process values. In such cases a remote I/O connection is the most efficient solution with the result that the entire fieldbus-based instrumentation is not yet today's standard.

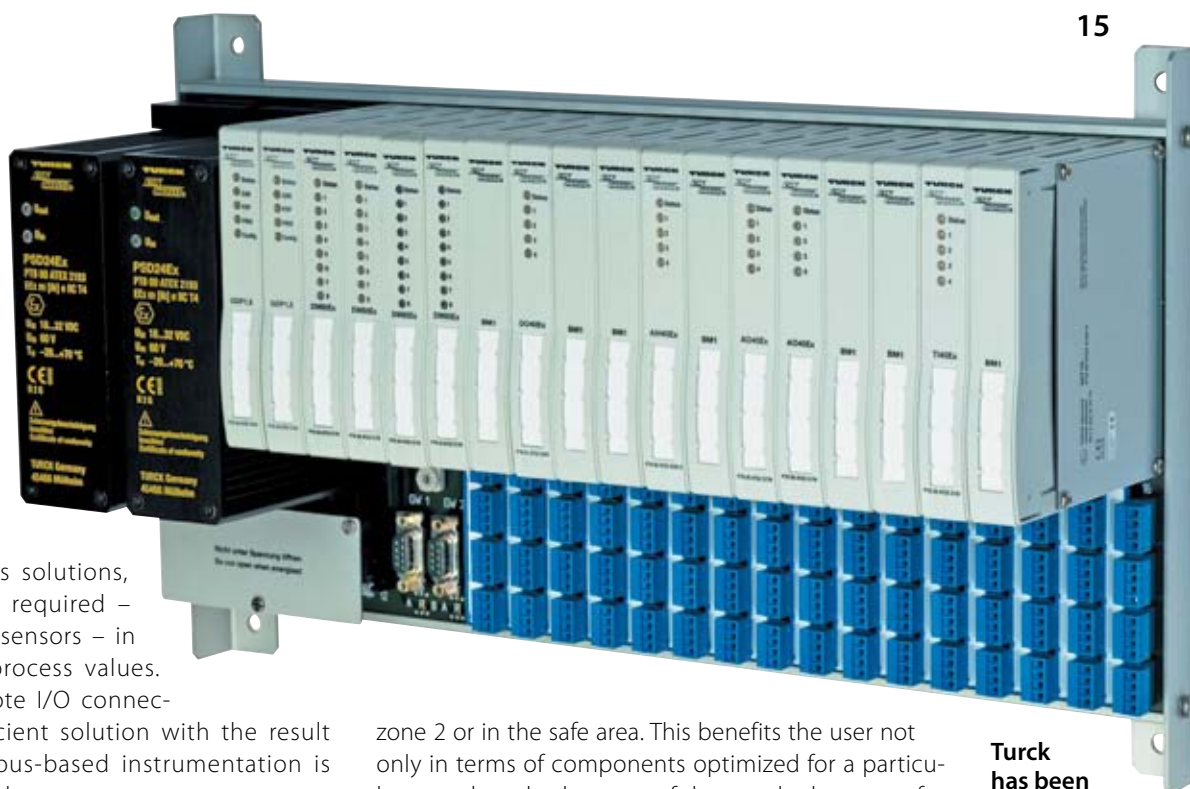
Complete physical layer portfolio

With its comprehensive physical layer portfolio, Turck is offering, for any connection variant, the right solution that can be optimized to the specific requirements. As well as a broad range of interface solutions in commonly available housing styles and numerous components for Foundation fieldbus and Profibus PA installations, Turck has now extended the range of remote I/O solutions with the BL20 and excom product families. The modular BL20 I/O system originally comes from factory automation, but was further developed with HART-compatible I/O modules and a redundant power supply for the requirements of the process industry. As many field devices can communicate additional information via the HART protocol, the HART compatibility of the installed connection technology is becoming increasingly more important, so that it is possible for a remote I/O station to convert incoming HART signals to a digital protocol.

Turck has been offering excom as a remote I/O system for use in zone 1 for the past twelve years, and this has now been expanded to a system family with a compact module rack and new power supply units for use in zone 2. The system transfers process and diagnostics data from the periphery and communicates with the HART field instrumentation if required. The control system is thus provided directly with additional information about process values, diagnostics and asset management in digital form. Furthermore, this is provided in a topology that requires considerably fewer bus cables than the H1-based Foundation Fieldbus and Profibus PA fieldbus systems.

Free choice of installation location

With the expansion of the excom family now presented, the user can choose the installation location without any restrictions. The system can be installed in zone 1,



zone 2 or in the safe area. This benefits the user not only in terms of components optimized for a particular zone, but also because of the standard concept for configuring and parameterizing the periphery and field instrumentation.

The functions and handling are the same for all types of installation. There is a standard structure and operating philosophy, both for the configuration using GSD files or DTMs, and for asset management. The system can in all cases be maintained and modified during operation. This applies both to adding individual measuring points as well as to extending a system with additional modules. The tried and tested redundancy options of excom are also fully supported.

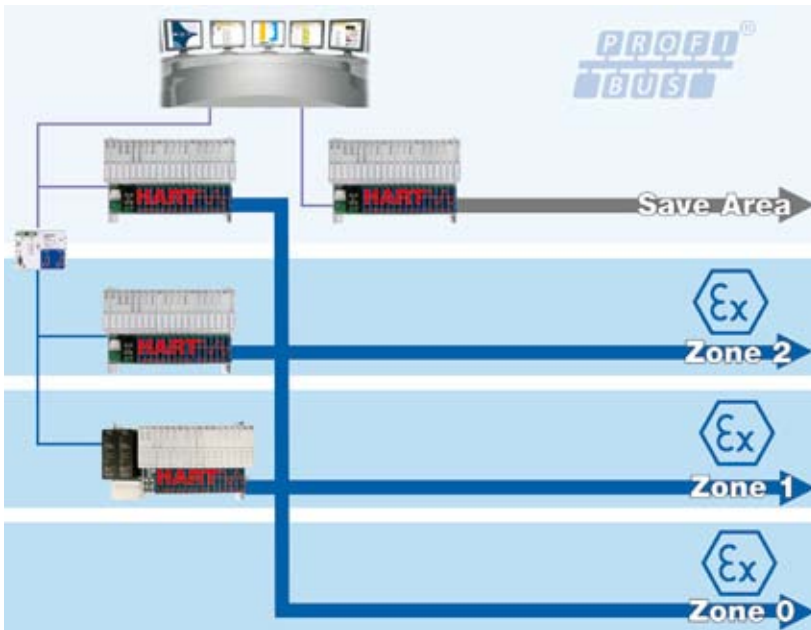
A standard Ex-i periphery supports the signal processing and field device control from zones 0, 1 and 2. If this periphery is installed in zones 1 and 2, a specially optimized power supply unit is available that generates the intrinsically safe system voltage so that the signals can be received as close to the instrumentation as possible. The interface to the fieldbus, in this case Profibus DP is also intrinsically safe. This configuration enables the entire system to be fully maintained during operation in the Ex area.

The identical Ex-i periphery can now, however, also be used in the safe area. A new module rack offers the possibility of operating up to 24 I/O modules, which further reduces the basic installation costs. As Turck has also developed a special power supply unit for this application area, the entire system is considerably more compact. In the housings previously used in

Turck has been offering the excom I/O system for use in zone 1 for the past twelve years

Quick Read

Turck has now optimized its excom remote I/O system for zone 1 also for use in zone 2, and has considerably expanded its system functions. Due to the fewer requirements, the system can now be operated in zone 2 with smaller power supply units and a more compact module rack. The new excom family thus enables mixed as well as exclusive zone 1 installations. The connected field instrumentation can even be started up without being connected to the control system beforehand.



Free choice: The excom family offers now tailor-made modules for any location

excom installations in zone 2, the available space can now be used for additional components, such as valve blocks or load switches. A special gateway provides the necessary protection of the Ex-i periphery to the bus so that a separate segment coupler is not required for implementing the intrinsically safe physical bus characteristics of RS485-IS. Even with exclusively safe area applications, the user benefits from the further developments of the excom family – particularly with the digital outputs: For example, an additional relay output is also provided that allows the switching of outputs with up to 0.5 A.

Independent startup with DTM

Previously, remote I/O systems had to be linked to the control system in order to test and set up the connected field instrumentation. As this always requires both systems to be available at the same time, waiting periods frequently occur if this is not the case – particularly with larger new installations. The new excom DTM and extended communication mechanisms in the gateway enable excom stations to offer a solution: the user can simply start up the periphery and field instrumentation via the Profibus network without the presence of a higher-level class 1 master of the control system. The installation of an additional service bus for this is unnecessary.

Only the PB-xEPI Ethernet-Profibus coupler or an alternative Profibus access point must be available. The PB-xEPI operates here as a class 2 master and communicates cyclically with the individual excom stations. If a class 1 master is running cyclical communication with other Profibus stations at the same time, this can continue undisturbed and without any restrictions. An additional engineering of the PB-xEPI in the control system is not necessary. In this way, any section of an installation can be started up at any time.

By using an FDT Frame such as PACTware, all the systems present on the Profibus can be scanned and

transferred to the project tree of the frame application. The startup engineers can then access all peripheral modules and HART field devices online. This makes it possible to check the entire cabling of the fieldbus, and also diagnose and configure the HART field devices with their associated DTMs. In this way, a validated transfer of the field installation to the control system is possible.

Adding measuring points

The new excom family provides the user with additional functions for changing the configuration during operation, for example by using the hot configuration in run (HCIR) functionality: Gateway and DTM now also support the ability to startup and test new measuring points or additional modules during operation before the transfer to the DCS. Without having allowed for the change in the control system engineering, this enables only those installation extensions that have already been validated to be selectively incorporated into the control system.

The DTM makes it possible to temporarily activate individual channels of the I/O modules that were previously deactivated without unnecessary diagnostic messages being reported to the operator of the control system. The correct wiring and functioning of a field device added to this channel can be checked so that it can then be started up. The additional field instrumentation can then be integrated easily into the process after the startup is successfully completed. This scenario is incidentally not restricted to a measuring point, as completely new I/O modules can be incorporated into the system during operation.

Firmware updates via DTM

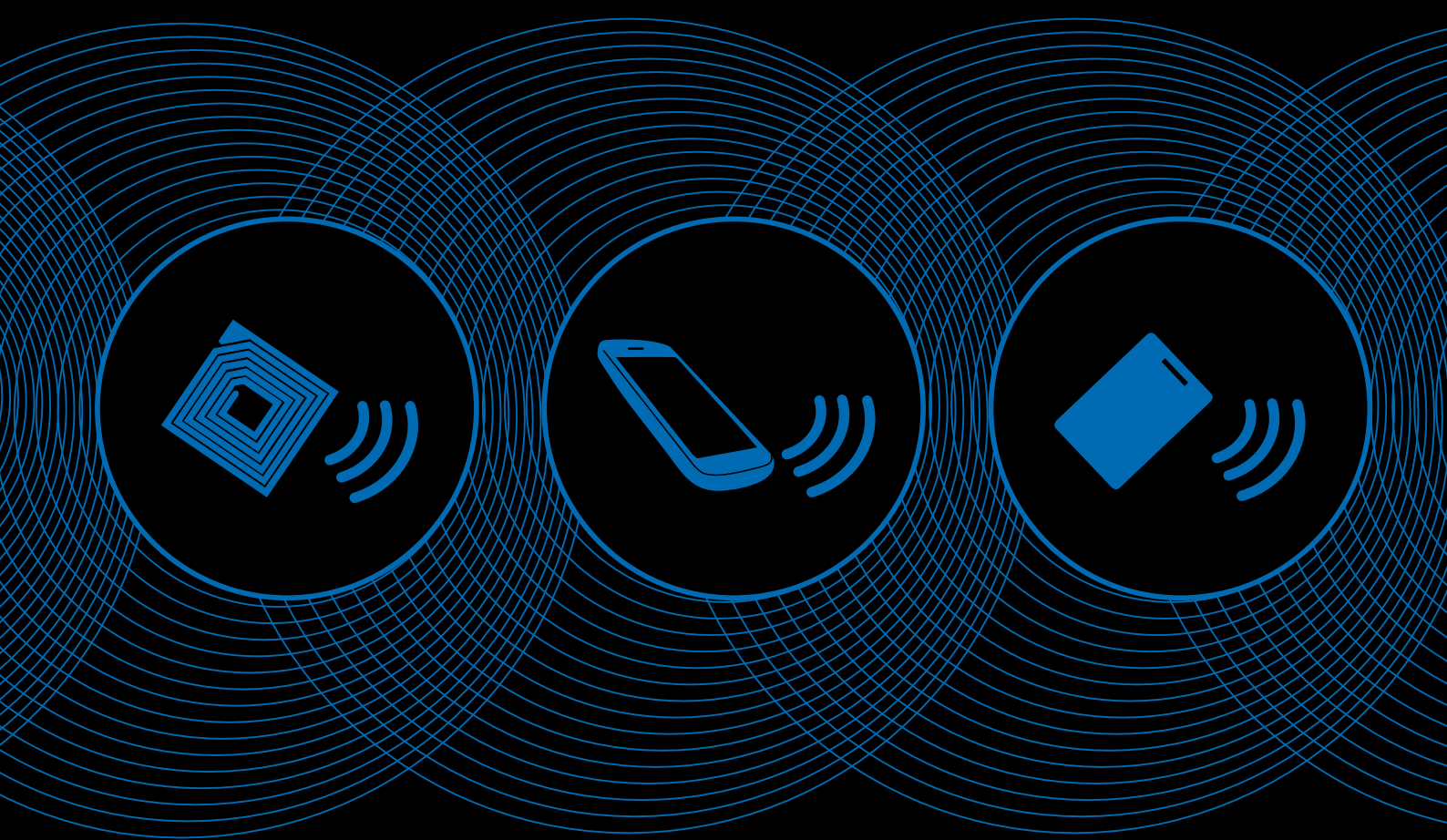
As the innovation cycles of excom normally involve enhancements in the functionality of the gateway, excom now also enables firmware updates to be completed in the field. The update is carried out using the excom DTM and the existing network infrastructure that is required for the DTM-based operation of excom. In this way, new functions can be added to the system smoothly from a central location and without any downtime. ■

► Fit for HART

Transmitters in the field level are now almost without exception able to transfer additional information as well as the actual measuring signal. The so-called smart transmitters are usually parameterized according to the HART standard. In many cases, however, this information cannot be used, since communication via HART was not planned for in the isolation level installed many years before. Such cases result in what are called stranded HART signals. In order to prevent this, remote I/O solutions are required that support HART communication and can let the relevant signals pass. In this way, the excom system brings the HART functionality directly to the control system via Profibus.

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weima - passion for shredding

weima

TH 3400 M: The Weima
press operates with
three inductive linear
position sensors
from Turck

Precise Presses

Machine builder Weima is shortening the mounting and setting times of its briquetting presses with inductive linear position sensors from Turck

Whenever new environmental laws are introduced, the Swabian town of Ilsfeld pays close attention. This town is after all where Weima Maschinenbau GmbH is headquartered. The company builds briquetting presses and shredders and has often profited from this kind of new legislation. For example, for the past 20 years the Federal Immissions Control Act has prohibited the woodworking industry from burning chipboard in pieces. The wood waste must be shredded instead and burnt with an admixture of oxygen. Only then are the right temperatures produced in order to fully burn any toxins from adhesives and paints. Since this legislation has been in force, Weima shredders have sold better than ever.

With its briquetting presses the machine builder is also profiting from waste disposal regulations. Today, everything that is recycled – whether aluminum or other metals, plastics, insulation materials, carpet waste or waste paper – is pressed into briquettes in order to optimize the storage, processing and transportation of correctly sorted waste. However, the main purchaser of briquetting presses is the wood industry, which is using them to meet the increasing demand for combustible fuel for fires or stoves. Wood chips are also being pressed for industrial processes such as in paper production. Compared to wood chips in bulk form, a wood briquette reduces the space required by 90 percent. This enables an ISO standard container to transport 30 tons instead of seven when it is filled with wood briquettes instead of chips.

With its shredders and briquette presses, Weima is one of the market leaders in Europe. In both product groups, the company is now using the inductive LI-Q25 linear position sensor from Turck. Wear-free position sensors are now in operation in two shredders and in the TH 1500 M briquetting press, as well as the larger TH 3400 M model.

Position sensing the double press form

Since Weima started with the construction of its first machines in 1986, the company has used inductive proximity switches for position sensing in its presses. Three distances or positions must be detected in every briquetting press: the position of the pre-compactor, that presses the wood shavings into a block; the position of the press stamp that presses the shavings into the briquette form, and the position of the double form into which the stamp presses the material into briquettes. The briquetting presses also have two ejector shafts for the briquettes.

The briquette is pressed in the right-hand side of the machine between the two ejector shafts. A double form is used as the press form. Briquettes are pressed



The presses not only produce 150 x 60 mm briquettes, considerably larger sizes are possible

in succession and are ejected on the left and right in alternation. While pressing is taking place in the right-hand press form, the machine ejects the finished briquette from the left-hand form. The left-hand press form is then moved in front of the press cylinder, and a briquette is then pressed while the right-hand press form is ejecting the finished briquette at the same time. This process is repeated continuously. In this sequence, one of the forms in the double form must always be located exactly in front of the press stamp. Otherwise, the pressure of approximately 600 bar produced by the press hydraulics of the largest briquetting press would be applied to the metal form instead of the wood shavings. The resulting damage would be enormous and would amount to the total destruction of the machine.

Instead of the proximity switches previously used, an inductive linear position sensor from Turck detects the position of the press form. The benefits start with the installation: the fitters previously had to screw in the proximity switches, adjust them precisely, fasten them temporarily and then finally secure them. "The switch also often broke off quickly if it was not adjusted exactly," Jörg Töpfer, sales manager of the Weima Group, describes the problem.

Fitters now only have to fasten the linear position sensor on the hydraulic cylinder of the double press

Quick Read

Weima Maschinenbau GmbH based in Ilsfeld, Germany, produces briquetting presses and shredders. Proximity switches were previously used to detect the positions of press stamp, press form and pre-compactor. To reduce production and service times, Weima is now replacing the complex designs with the LI-Q25 inductive linear position sensor from Turck. The customer now benefits from the possibility of visualization and remote control for the machines.

The compact TH 1500 M briquetting press can be lifted and transported with a forklift



form and link the guided positioning element of the sensor to the hydraulic piston. The electricians then teach the sensor automatically via the PLC. For this the PLC moves to the “Left position” and “Right position” of the press form and records the relevant measured values of the linear position sensor as switching points. The specialists at Weima have programmed the sensor like a switch. The PLC evaluates the 4...20 mA analog signal only in relation to the two positions of the double form and for visualization.

Position sensing of the press stamp

In order to detect the press position, the company now uses a LI-Q25 linear position sensor which replaces the two proximity switches that previously detected the start and end position of the press piston (press stamp). Weima fitted the position sensor on the hydraulic cylinder and linked the positioning element to the press piston. The mounting and calibration is just as easy as for the sensor on the double form. The PLC calibrates it almost automatically.

Thomas Steiner, responsible for electrical engineering and control cabinet construction at Weima, explains the benefits of the new solution: “the setting problem is no longer there. Previously I had one proximity switch and had to move to the positions and move the sensor until the input switched. Now I move to one position, write down the measured value and define it as either

back or front. A five millimeter difference in the mounting of the sensor is not important since calibration is not completed until afterwards.”

A central benefit of position sensing with Turck's inductive resonant circuit measuring principle compared to a magnetostrictive process is the fact that the inductive system works without magnets. It is based on an oscillation circuit formed by the positioning element (resonator) and the coil system of the sensor, and is therefore not susceptible to magnetic fields or metal environments. As well as interference immunity, the measuring system offers Weima the advantage that metal shavings and dust do not clog the positioning element, since the company also markets presses for briquetting metal shavings.

Linear position sensor instead of bead chain

The third linear position sensor detects the position of the pre-compactor located above the actual press chamber. It compacts the chips at a low pressure so that they do not enter the press chamber in an uncontrolled manner. The pre-compactor meters the pressing material into the press chamber and requires for this continuous information about its current position of movement. In Press mode, it supplies a defined quantity of wood shavings. In Length mode, it adds shavings gradually until the defined standard length of the briquette is reached.



The analog signal of the LI sensor on the pre-compact is visualized directly on the control panel

Up to now, Weima technicians have used a linear position sensing system they designed in-house. A proximity switch determined the position of the piston by scanning a bead chain on the cylinder. The chain consisted of metallic and non-metallic beads in alternation. When the piston moved, the proximity switch detected the switch pulses from the passing chain, which were counted in the PLC in order to determine the distance traveled. This design was imprecise and required a great deal of effort for installation and calibration.

In this application, the linear inductive position sensor can fully utilize its strengths, since not only the switch information is required in this case but also precise position information. The setting is carried out in the same way as the other two cases using a teach routine of the PLC.

However, Steiner also values the possibility to visualize the entire press operation on the display: "The visualization is very important for us. Previously we could only show the movement of the slide schematically on the screen. The user can now follow and set the entire press operation one to one on the visualization display. If the machine ever stops at a position that is difficult to access, all parameters can now be set from the control cabinet – something that was previously not possible."

Competitive edge of the Turck linear position sensor

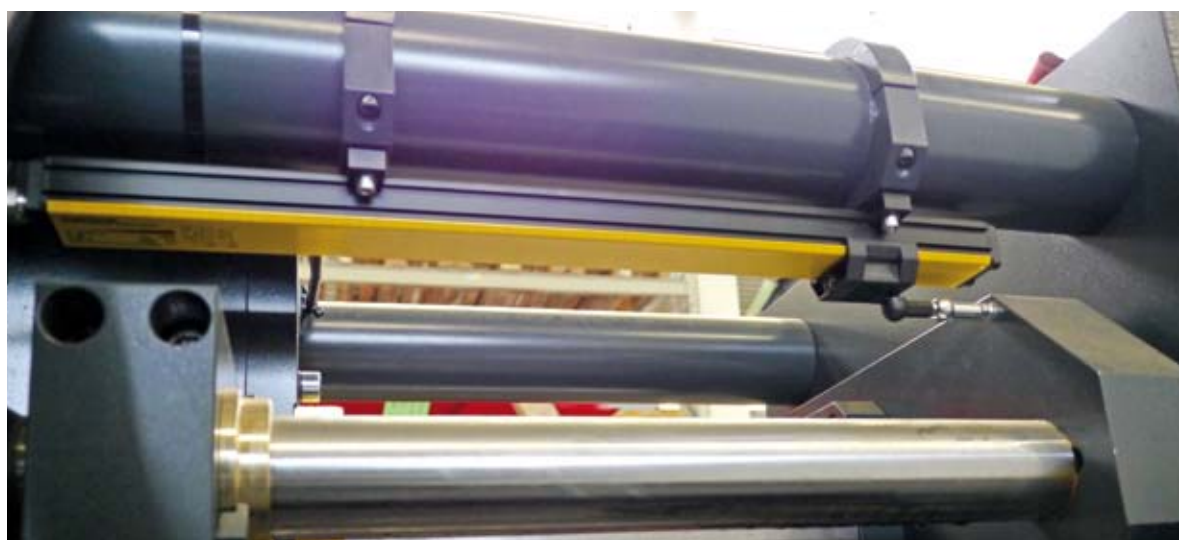
Sales manager Töpfer explains the benefits of the linear position sensors from his point of view: "The Turck technology puts us one step ahead of our competitors. Previously, linear position switches were not used by competitors, and only limit switches and proximity switches were used. This involves considerably more setting effort in production and service than we have. This also means that, with our service operations, customers incur lower maintenance costs. We have also really further developed our machine with the Turck technology and not just upgraded it. The possibility of visualization and remote control give the customer genuine added value."

Töpfer admits that the price for the new solution is higher than that of the individual proximity switches, but immediately adds that the costs were previously incurred elsewhere, i.e. in production and servicing. The authorized representative of the company knows that you must not just compare the list price of two components to make a meaningful cost calculation. Complete solutions and their effects on all costs over the entire life cycle of the product must be taken into account before making a decision. "The price comes out right in the end," Töpfer concludes. ■



“We have also really further developed our machine with the Turck technology and not just upgraded it. The possibility of visualization and remote control give the customer genuine added value.”

Jörg Töpfer,
Weima



The inductive positioning element moves reliably in a guide track along the LI-Q25

Author

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Inductive linear position sensors in the Flying Fish roundabout ride now ensure reliable position sensing of the gondola arms

User www.zierer.com

Flying Fish

Zierer uses Turck's linear inductive position sensors with IO-Link interface

Amusement parks today are a crisis-proof sector of the economy all over the world, both for the owners and for their equipment suppliers. "Particularly in the difficult times, the visitor numbers to amusement parks have increased considerably – and continue to do so," explains Wolfgang Brück, managing

director of the amusement ride manufacturer, Zierer Karussell- und Spezialmaschinenbau GmbH, Germany. "In the amusement sector, the owners need to make regular investments in order to offer new attractions. Zierer is therefore in a good position even in times of economic crisis. We were and continue to be well in demand."



The company was founded in 1930 in Deggendorf, Lower Bavaria, and is one of the leading suppliers of family amusement park rides. Amusement parks and fair operators all over the world know and value Zierer amusement rides on account of their high quality workmanship, their safety standards and their low maintenance requirements. As a result, Disneyland, Universal Orlando, Tivoli Copenhagen, Busch Entertainment Corporation, Movie Park, Everland Korea and many other amusement parks worldwide are customers of the company.

From planning to design, continuing through to production and after-sales services, Zierer is the single

Quick Read

In its Flying Fish roundabout ride, Zierer Karussell- und Spezialmaschinenbau GmbH previously measured the horizontal position of the gondola arms using individual proximity switches. However, with five sensors for each of the twelve hydraulic cylinders, mounting, calibration and integration in the ride control system were really complicated, especially as the height measurement could only be approximated. For the first time, Zierer is now using inductive linear position sensors from Turck, that supply an analog signal and can be parameterized from the PLC via IO-Link.



“The LI sensor not only saves investment costs but increases the availability of the ride and helps to increase operational safety.”

**Wolfgang Brück,
Zierer**

source for a full range of services for the construction of fairground machinery. All amusement rides are manufactured to order and designed to customer requirements. Only the technical design is largely pre-determined.

Fun with optimum safety ensured

Amusement rides must not only be enjoyable to their guests, but must also be safe. In this sector, the requirements are often higher than conventional industrial plants. “After all, this ultimately involves passenger transport,” Brück points out. A classic in the Zierer offering is the Flying Fish roundabout ride. With this ride, passengers sit in twelve fish-shaped gondolas. Affixed to metal arms, the gondolas turn around the center of the ride. The twelve fish arranged in a star can be moved up and down hydraulically on their arm. The ride passengers particularly enjoy the fact that they can control the horizontal movement of the fish with a joystick.

Zierer also offers the option with the Flying Fish ride of spraying fish, so that passengers have to dodge water jets if they want to stay dry during the ride. As safety should not suffer on account of the control options

of the passengers, the movement of the arms must be measured exactly and must be dampened at the top and bottom of the hydraulic system. Otherwise the gondolas could move to the end stop with a jerk, which would not be a pleasant experience for riders.

In order to determine the horizontal position of the arms, Zierer previously used five sensors on each hydraulic lift cylinder. Although this ensured safe operation, the installation of the sensors and their adjustment was relatively complex. There was also another reason why the designers searched for an alternative sensing method: the position of the gondolas could not be determined exactly at any time, but only at the five critical points where the sensors were mounted. “The range in between was a no-man’s-land,” says Klaus Gäck, project manager. “The controller didn’t know whether a fast upward or downward movement was possible, because it wasn’t known if the gondola was five or 150 centimeters away from an end point.”

Alternative linear position sensor

A solution using linear position sensing was considered in October 2011. Zierer looked for a linear position



Instead of having to use five proximity switches for each hydraulic cylinder, a 1,000 mm linear position sensor from Turck now supplies the exact position of the arm

sensor that measures the travel of the hydraulic cylinder up to its total length of 1,000 millimeters. Besides testing the sensors of other manufacturers, the Zierer project team also tested the LI-Q25 inductive linear position sensor from Turck. This sensor operates on the resonant circuit measuring principle which offers a high level of precision and interference immunity. Unlike magnetostrictive sensors, position sensing is not implemented via a magnetic positioning element, but with an inductive resonant circuit, i.e. an oscillating system consisting of a capacitor and a coil. Magnetic or metal environments, offset or vibrations can not impair the precise measuring function of these linear position sensors.

The LI-Q25 has very short blind zones because the sensing electronics are integrated over the entire length of the sensor. The system is currently the only one of its kind on the market. Zierer was suitably impressed by the test results of the Turck sensor. Even with rapid movements and the resulting centrifugal forces, the sensor reliably supplies the exact position of the positioning element via the 4...20 mA analog signal. The controller can determine from this the exact position of the arm at any time. Project manager Klaus Gäck was completely satisfied with the test result and summed up as follows: "For us the quality and reliability of all components in the operation is very important. The Turck linear position sensor seems to be exactly the right choice here."

Parameterization via IO-Link

Despite the positive test, two other requirements had to be clarified afterwards: for safety reasons, Zierer also wanted the possibility to indicate any failure of the positioning element. Although an LED on the sensor indicates if the positioning element is outside of the measuring range, Matthias Niedermeier, in charge of the electrical design, wanted to output this signal on the controller. Here the LI sensor was able to impress thanks to its ability to be parameterized via IO-Link. The IO-Link interface allows the user from the controller to define the measuring ranges, invert the output signal or simply output special signals like the failure signal. Niedermeier parameterized the sensor so that the "positioning element missing" signal was output separately via the IO-Link channel, just like all other error messages. The controller recognizes this special condition and shuts down the ride according to a stored safety routine.

Zierer had another requirement with regard to the MTBF (Mean Time Between Failures) values, which provide information about the probability of a device failure. The calculation of the value is based on operation at 40 °C. An analysis in accordance with directive SN 29500 (Ed. 99) has determined that the LI sensor can be operated for 138 years without failure. This probability of failure impressed everyone involved in the project. Managing director Brück was also impressed by the quality: "The sensor not only saves on investment costs but also increases the availability of the ride and contributes to greater operational safety."



With its short blind zones, IP67 and contact-free inductive positioning element, the LI sensor is ideal for the rugged use required in fair-ground machinery



Zierer electrical engineering specialist Matthias Niedermeier, parameterizes the LI sensor conveniently via the IO-Link interface, which also supplies all error signals to the PLC

Ultimate test

Zierer is currently building the first Flying Fish version with a total of twelve LI sensors for an amusement park on Lake Neusiedl near Vienna. "This is where Turck can demonstrate the robustness and reliability of its sensor technology," says Brück. If the sensor proves itself in continuous operation, Zierer will make it a standard product for other installations. ■

Author

Paul Gilbertson is a Technical Communicator at Turck USA in Minneapolis



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Stonemaker's DM-185 is the world's first and only mobile concrete and stone producing factory

User www.stonemaker.com Integrators www.internationalhydraulics.com www.hilco-inc.com

Building for the Future

Fieldbus and connection technology from Turck supports Stonemaker machines for mobile stone production

They say that confidence is the key to successfully implementing any plan. This key element is not something that can be faked or falsely believed in. You either have confidence in your product or you don't. The concept of confidence in your ideas is some-

thing that Stonemaker inventor Gary Troke is familiar with. What started as a personal project has now turned into a revolutionary concept that could change how things are built around the world. This ground breaking new technology, which acts basically as a por-



table stone making factory, has the ability to single handedly build a city; from the foundation building blocks all the way to the roof tiles.

A novel concept

Stonemaker is founded upon a simple yet incomplete idea. What if you built a machine that could be used to create concrete blocks using your surrounding materials, cement powder, and diesel fuel for the machine, anywhere in the world? With that idea, Troke went to work on building the first Stonemaker machine. The first machine he built worked just fine, but didn't have

nearly enough versatility to be used the way he envisioned in the field. The machine used manual switches, relays, and push buttons to operate which really hindered its potential uses in the real world.

Stonemaker can produce up to 240 sq/ft of stones per hour or 5 cu/yd per hour using wet mix

Quick Read

Stonemaker is a machine that has the ability to act as a fully functional yet portable stone making factory. Incorporating Turck products, especially plug and play connectivity, into this machine allows it to operate more flexible and be assembled on site anywhere in the world.

The Stonemaker Team: (Left to Right) Stonemakers' Gary Troke, Hilco Inc. Scott Price, International Hydraulics' Terry Kelly, and Turcks' Anthony Molnar



Call for help

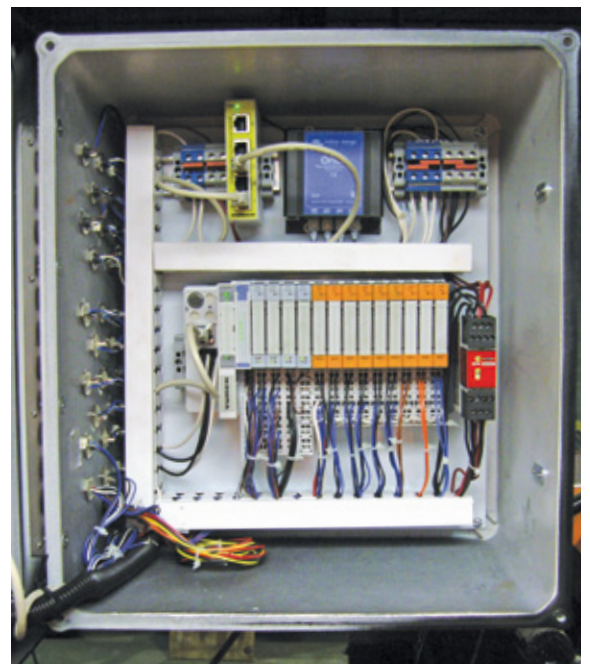
After struggling with the time consuming manual nature of the machine, Troke received a suggestion from someone he was working extensively with for the electrical part of the machine, Terry Kelly of International Hydraulics. Troke was working exclusively with Terry and he suggested and brought in Scott Price, from Turck representative Hilco Inc., to see what potential improvements Turck could make to his invention. Scott Price, along with fellow Hilco application

engineer Bob Dodrill and Turcks network application expert Anthony Molnar, devised a plan to fully automate the processes. Working with International Hydraulics, and in turn, Turck, the machine has evolved into a mobile and versatile machine that can make concrete aggregate literally anywhere in the world, utilizing its ability to use almost anything and turn it into a sturdy, robust building block.

Once involved in the project, the trio saw a variety of ways Turck products could be used to improve and streamline the operation of the machine above and



The new control panel allows centralized operating of the machine



Turck's BL20 I/O system with Ethernet switch simplifies assembly and startup on site



beyond just automating the processes. The machine now uses the modular BL20 programmable gateway programmed with CoDeSys, which offers the versatility that optimally suited the machine. It also uses mobile equipment sensors along with a transducer, which is connected to a compression head, to monitor the amount of pressure exerted on the material as it is molded into its intended form ensuring it meets local building standards.

Plug and play

Perhaps the biggest advantage found throughout this process was that Turck was able to provide an entirely "plug and play" connectivity solution creating modularity for the entire machine. As owner Gary Troke explains, "Connectivity turned out to be the key to the application; without the connectivity solution from Turck it would not be possible to send these machines all over the world with confidence they would work as intended after they got to their destination." Stonemaker machines are built at their production facility in Canada, disassembled and sent around the world, and then reassembled.

Thanks to a custom panel located on the machine where all of the connections are made, this reassembly is a quick and easy process that does not require an electrician for wiring the devices. Overall, this digitized Turck solution allowed for the machine to be more productive and more reliable. The sophistication of the programming done by Turck's Anthony Molnar allowed the machine to use a single mold instead of cycling through hundreds of molds as the electrical configuration eliminated stops in the process which required multiple molds to be used. The programming also allows the end product to be produced

with more consistency and cut down cycle times from 15 seconds per cycle to just 11 seconds.

Upcoming opportunities

Potential uses for Stonemaker include opportunities in Africa and even Haiti, "One really exciting potential application is in Haiti; where you could potentially use existing materials and rubble from the earthquake and in effect recycle and re-use those materials back into aggregate block to rebuild with." Stonemaker is just now entering its introductory phases, and already has orders in North America and Africa. In addition, Stonemaker is gearing up to introduce their machines into South America and Central America soon where a great deal of interest has already been shown. Stonemaker has already been approached by the military about a contract for the machines. To keep up with the interest already shown in Stonemaker they are already in works to open a manufacturing facility located in Roanoke, Virginia.

Conclusion

As Stonemaker machines are introduced and sent out worldwide, they will be sent out with the requirement that they can only use Turck parts where applicable to ensure their reliability. Troke describes, "The integrity of the machines and the components in the machine become more important than ever in remote areas. If something were to break in a remote area there would be no way to fix it so products that are proven to survive and last in harsh environments are of the utmost importance. Really it comes down to the confidence knowing when you hit a button you know exactly what is going to happen every time." ■



“Without the connectivity solution from Turck it would not be possible to send these machines all over the world with confidence they would work as intended after they got to their destination.”

Gary Troke,
Stonemaker

On the Right Track

Turck's BL ident RFID system is ensuring the correct allocation of components in engine production

The engine is probably the most complex and technically demanding part of the entire automobile. If different variants of an engine are built on the same assembly line, this complexity increases further. Engine assembly lines are accordingly also detailed and complex. Engine production is a sequential process with defined stations. Once a component is fitted, it is not easy to reverse the operation – at least not without a justifiable amount of time and expense.

The consequence from this is that the countless number of components on each engine must fit perfectly and exactly in accordance with customer specifications. In order to ensure this and to exclude errors as much as possible, one automotive manufacturer in China is using RFID in its engine production for the mounting of moving parts. This ensures error-free and completely transparent production for the customer.

Multi-variant production

System integrators Tianyong Mechatronics, based in Shanghai, used Turck's BL ident RFID solution to implement the quality assurance and control of engine production. The customer produces several engine variants on one assembly line. RFID read/write heads identify the current engine variant using an RFID tag that is fitted to the workpiece carrier of the engine blocks. The system reads the appropriate configuration of the necessary components from a database and links them with the current engine. Large engine components are provided directly with a tag while smaller components are brought into the line in special carriers.

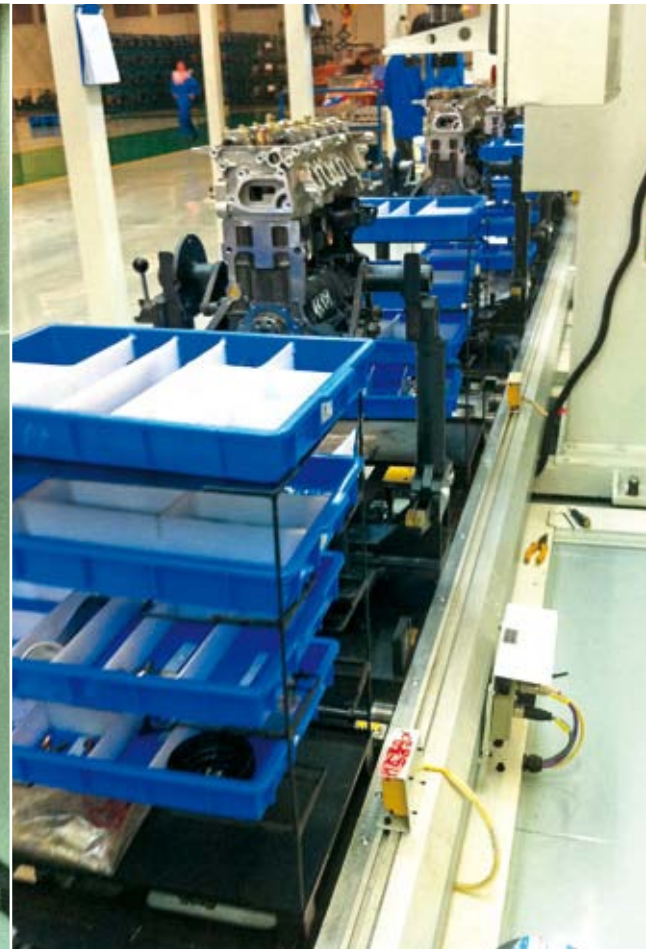
Workers sort the smaller components in picking containers. The read/write heads on the assembly lines read the engine ID so that the controller can automati-

Author

Qiang Lin is a product manager at Turck China in Tianjin

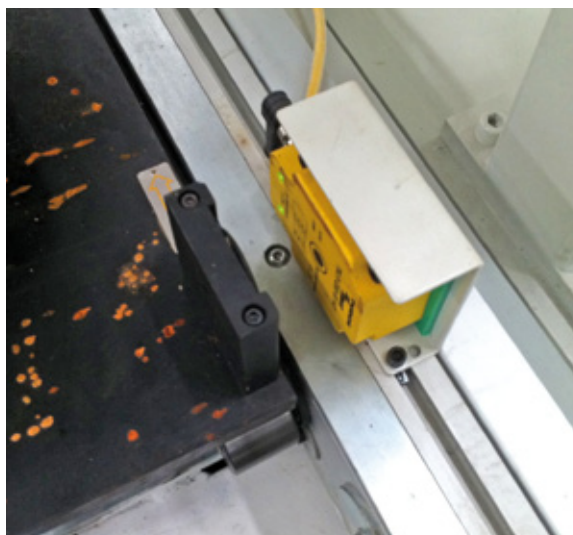


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Picking containers directly supply the correct components for an engine block

Turck's BL ident RFID system ensures the reliable assignment of engine components on the drive train assembly line



The RFID read/write head reads out the tag on the workpiece carrier in passing

cally request the required components. Light signals at the corresponding shelf compartments indicate to the worker the parts to be selected for each specific engine. Employees take the parts and acknowledge that the correct components have been picked.

A worker brings the carriers with several vertically arranged boxes to the assembly line where they are transported by a conveyor belt on multi-layered carriers. Tags are fitted to each individual shelf frame, and these move past the read/write heads of the stations. The system can thus assign the picking containers to the correct engine and enable the production of several engine variants on a single assembly line.

The data of each tag is also stored in the central database. This enables the current production status of each engine to be called up at any time. The system also writes onto the tags test values and measures data taken at the production stations, and compares them with the reference values stored in the database. The tags also contain the IDs of the engine and the components as well as additional information. The eight kilobyte memory is sufficient for this and all data is available for statistical evaluations, quality assurance and to ensure the complete transparency of production – even after the day of shipment.

This provides the automotive manufacturer with complete statistical data about production, enabling error accumulations and their sources to be identified and rectified systematically. Despite the comprehensive acquisition of data, the customer also required additional protection from data loss or write errors through unexpected disturbance factors. The system integrator therefore recommended the additional use of a Turck RFID handheld device. This enables assembly workers on the line to carry out read/write operations manually in order to check tags spontaneously without having to initiate a stop on the assembly line.

As different fieldbus protocols are used in the application for different tasks, the modularity of Turck's BL ident RFID system made a good impression. The read/write heads on the line are integrated in the



Turck's BL67 I/O system provides communication with the PLC via Modbus TCP and Profibus DP

infrastructure with BL67 I/O systems. A gateway communicates via Profibus DP with the Mitsubishi PLC and is responsible for the control and communication of the RFID read/write heads. UHF read/write heads can be connected to the same BL67 I/O stations if the system requires the integration of additional identification tasks using the larger UHF sensing range in the future.

Ethernet stations are used for monitoring the fieldbus, collecting information and for production planning. Here too, Turck supplied a BL67 gateway which communicates with a PC directly via Modbus TCP, monitors all field information in real time and locates important components.

Impressive modular solution

Chuanhua Rong, project manager at system integrators Tianyong Mechatronics, was impressed by the flexibility of the BL ident system. "The modular structure enabled the same BL ident modules to be used on different gateways. This simplifies model selection. We only had to replace the gateways to implement different protocols. The same RFID base modules, read/write heads, tags and cable sets could be used for all gateways."

The customer can connect up to eight read/write heads to each gateway, as well as additional digital and analog I/O modules. The required sensing ranges between 0 and 200 mm were ideal for the requirements of the application. Another benefit also impressed Rong: "The prefabricated cables enabled us to considerably reduce our installation expenditure. The program adaptation using the standard PIB function blocks was also completed very quickly." ■



“The modular structure enabled the same BL ident modules to be used on different gateways. We only had to replace the gateways to implement different protocols.”

**Chuanhua Rong,
Tianyong Mechatronics**

Quick Read

An automotive manufacturer in China is using RFID to coordinate the production of different engine versions. System integrator Tianyong Mechatronics chose Turck's BL ident RFID system – because the modular system was easy to integrate in the existing Profibus DP and Modbus TCP network structure.

Interface Technology 2.0

The high channel density of the Interface Module Backplane (IMB) ensures space in the control cabinet

Turck's Interface Module Backplane (IMB) adds a robust and extremely compact I/O solution to its comprehensive portfolio. With a footprint of only 175 x 210 mm, the backplane provides space for eight interface modules and thus up to 32 digital or 16 analog inputs/outputs – as required by the customer. Depending on the application, this enables users to implement control cabinets with a very high channel density of up to 1,152 channels.

The new module racks come with a host of smart features: with standardized analog and digital system couplings for the Honeywell C300, Emerson DeltaV and Yokogawa Centum process control systems, a redundant power supply and a high temperature resistance, the IMBs enable a new level of flexibility in the control

cabinet. Thanks to their low price per channel compared to DIN rail installations, the easy-to-handle IMB point-to-point solution is ideal both for fully expanded control cabinets with several hundred inputs and outputs, and for less complex applications with only a few I/Os.

Minimum engineering expenditure

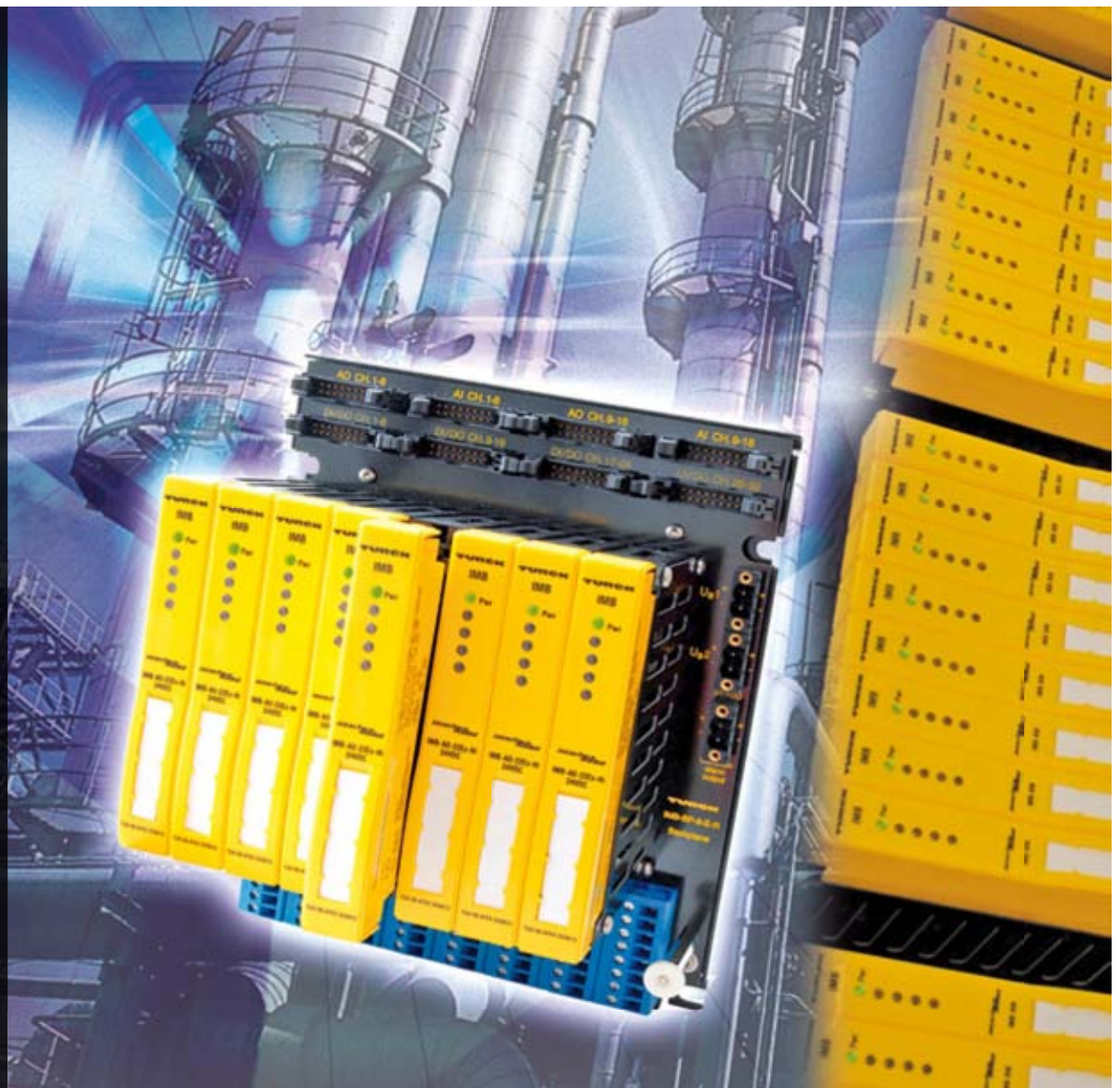
The main benefit of the station: because the Backplane unites the entire connection level, and the galvanic isolation of the I/O channels can be implemented simply by inserting the interface cards, the engineering effort is reduced enormously for the entire interface level – both for maintenance and for scheduled expansions. The easy to access screw or spring terminal connec-

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With the Interface Module Backplane, Turck has created a new generation of interface technology

Quick Read

Turck's Interface Module Backplane combines up to 32 I/O channels with galvanic isolation and a redundant power supply in a minimum of space, thus creating more space in the control cabinet. HART-compatible analog cards and temperature measuring amplifiers that can be parameterized via a DTM complement the I/O solution, thus providing a seamless concept for the level between field devices and process control system.

tions, as well as the color coded and spatially separated system connections, effectively prevent connection errors. In addition to this is the convenient "hot swap" functionality offered by the system.

The pin assignment of the system connections is adapted directly to the relevant process control system, so that users no longer require special connection modules, and can instead use inexpensive prefabricated 1:1 cables that are readily available – a considerable benefit in terms of the supply of the electronic components used, as well as the installation and maintenance costs of the interface level.

Safety on board

The backplane is the jumpering level for the entire I/O solution and is a completely passive component. Unlike similar systems, there is no active component on the hardware which could shut down the entire isolation level in the event of a failure. As each interface card is also protected individually, the availability of the isolation level is also ensured even if individual channels fail. Turck's IMB also offers a simple redundancy concept for the connection level to the control system. While conventional point-to-point cabling only allowed broken connections to be compensated for by doubling the input signals, the redundant terminals for the I/O cards of the process control systems allow the implementation of separate safety concepts for electronics and cabling.

The energy requirement of a plant is becoming an increasingly important factor for the plant operator, in addition to the availability of the interface level and consequently that of the entire plant. The efficiency of a process ultimately depends on the total cost of ownership, in which the energy requirement of loop powered 4...20 mA transmitters can play a significant part. Here developers at Turck have been able to reduce the energy consumption of the isolating transducers (AIA) without a reduction in power. The loop powered analog input/output cards are also highly energy efficient.

Transparency down to the field level

Both dual-channel analog input/output interface cards and the available isolating transducers are HART-compatible. A HART signal modulated on the analog signal enables additional information from the field device level to be accessed directly. Using special device drivers, the so-called DTMs, users can thus parameterize

the temperature measuring amplifiers in use and the field instrumentation below the isolation level with a single vendor-neutral engineering tool, such as the free PACTware configuration tool. With just a few clicks of the mouse, the parameterization tool ensures the easy and user-friendly management of the DTMs, regardless of the bus protocol, the visualization of features and settings, and the parameterization of the connected devices.

The interface cards also provide diagnostic LEDs for indicating the relevant operating states. Up to four dual-colored LEDs (digital input/output cards) indicate in yellow the switching states of the monitored outputs. When the input circuit monitoring is activated, the appropriate LED changes to red if a fault occurs in the input circuit, and the corresponding output relay and alarm relay are switched. The interface cards therefore make it possible to monitor the functioning of the I/O level directly at the device in the control cabinet.



Particularly for installations with a high channel density, the IMB is a good alternative to conventional interface solutions

High temperature specification

Just like the DIN rail interface devices, the IMB interface cards also stand out on account of their high temperature specification. With an operating temperature range of -20 to +70 °C, the backplanes fitted with cards are also suitable for installation in non-climate-controlled cabinets or in the upper areas of control cabinets where there is more exposure to warm air from fans. The design of the passive backplane ensures efficient heat dissipation – regardless of whether the devices are arranged horizontally or vertically. This benefit not only increases flexibility in handling the IMB but also increases its Mean Time Between Failures (MTBF), and thus its reliability.

Conclusion

With the Interface Module Backplane (IMB) and the associated two and four channel interface cards for up to 32 digital or 16 analog I/O channels, Turck makes it possible to implement a channel density in the control cabinet that is not possible with DIN rail interfaces. Particularly in processing plants involving several thousand I/O channels, the compact backplane solutions are a major benefit. ■

Turck at Trade Shows

At numerous national and international trade shows, Turck will introduce you to current product innovations and reliable solutions for plant and process automation. Be our guest and see for yourself.



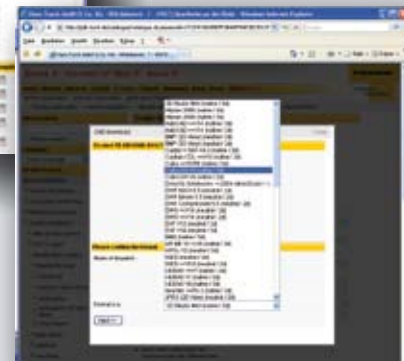
Date	Trade Show	City, Country
23.04. – 27.04.2012	Hannover Messe	Hanover, Germany
09.05. – 11.05.2012	Expoindustrial	Cali, Colombia
14.05. – 18.05.2012	Technical Fair (UFI)	Belgrade, Serbia
22.05. – 24.05.2012	SPS/IPC/Drives Italia	Parma, Italy
04.06. – 07.06.2012	Eliaden	Lillestrøm, Norway
18.06. – 22.06.2012	Achema	Frankfurt, Germany
24.06. – 26.06.2012	DCS	Miskolc-Lillafüred, Hungary
26.06. – 29.06.2012	Expo Pack	Mexico City, Mexico
09.10. – 12.10.2012	Vienna-Tec	Vienna, Austria
09.10. – 12.10.2012	EloSys	Trencin, Slovakia
06.11. – 08.11.2012	ISA	São Paulo, Brazil
27.11. – 29.11.2012	SPS/IPC/Drives	Nuremberg, Germany



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Turck on the Internet

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