Issue 01
2010

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The Magazine for Customers of the Turck Group

IO-Link Fine-tuning

"The physics works, now the fine-tuning is about to come," says Klaus Ebinger Page **10**

RFID in a Hospital

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Luggage Control

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Get an Angle on it

Robust inclination sensors from Turck allow reliable inclination measurement up to 360 °

It's All in the Mix

It can be a two-stroke engine, a tea or the seeds for your lawn, only with the right mixture will you get the performance you want. If the single components complement one another, the engine purrs like a kitten, the tea is an ultimate sensation of taste and the lawn will survive a soccer-game. It is the same with automation technology. You expect more than just a catalog full of good products from your supplier, even if good products are the base for the right mixture. But there is no need for the perfect product if it does not fit to your specific problem, if you can't reach your contact person or if you receive the product only after weeks or a month.

Turck considers itself a solution-orientated partner for its customers, and it is our goal to offer you all the components for the right mixture to the best of our ability. More than 15,000 products are the foundation for your individual solution. All of our products, including their data sheets and CAD-drawings, are listed in our product data base at www.turck.com. And if there is a product that does not fit 100 percent, we will make it fit because the close cooperation with our customers is an important part of our partner philosophy.

As a company that develops and produces their products in Germany, Switzerland, the United States of America and China, we are always close to our customers. This makes individual and customized solutions very easy to accommodate, while taking into consideration the regional differences. If this is too abstract for you, please take a look at the articles about different applications in this magazine. Therein our customers explain why they chose Turck. It is nearly always because of the right mixture of innovative products, solution-oriented approach and support.

If you want to meet us personally, come and be our guest at the **Hannover Messe, booth H55 in hall 9**. We would like to arrange the right mixture for you.

We are looking forward to seeing you!

Yours faithfully,

Oliver Marks, vice president business unit automation products

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To measure position in their offshore drilling rig, Streicher uses inductive Namur-sensors with a high operating distance from Turck. **Page 26**

The American packaging specialist Pro Pack Systems trusts the sensor, fieldbus and connection technology from Turck for its packaging machine. **Page 28**

In Beierfeld, Saxony, Turck duotec develops and produces customized electronic components for its customers from different industries. **Page 36**

Turck Subsidiary in Austria

▶ Turck is now represented in Austria with its **own subsidiary**. The Mülheim-based company has bought 100 percent of its long-time representative in Austria, Intermadox GmbH, based in Vienna. Beginning May 1, Intermadox GmbH will officially be renamed to Turck GmbH. In addition to the Turck solutions, the Austrian subsidiary will continue to offer products from Banner Engineering, Escha, Lenord+Bauer, ASM and Gefran in Austria. Stephan Auerböck, sales manager and authorized representative, will take over business operations. Auerböck was already responsible for sales activities with Intermadox. Christian Wolf will act as provisional managing director of the new Turck GmbH.

Stephan Auerböck

Identification in Application Park

▶ At the Vision Application Park at the Hannover Messe **(booth B24, hall 17),** visitors can order their own special figure of Playmobil and witness the automatic transformation of their order into a customized product. In a large multi-vendor-machine, the Application Park shows a multitude of optical test procedures. The visitor can see for himself that there is a solution for nearly anything. The Park connects vision, handling and automation technology and offers plenty of information on these subjects. Ten modular test units and processing cells are connected to a transfer system.

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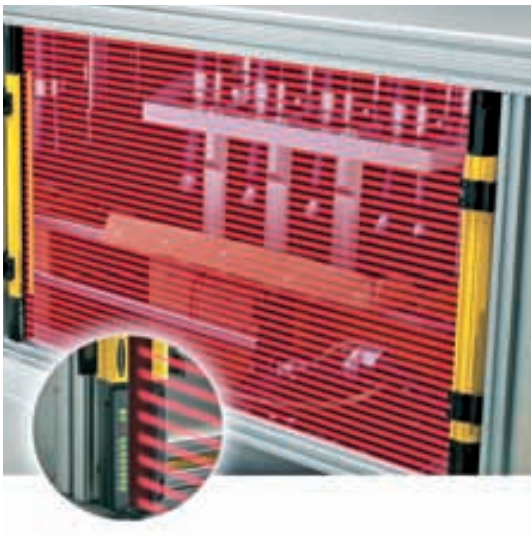
Inclination Sensor Series

▶ Turck has presented a new inclination-sensor series made for various applications such as robots, vehicles, planes, harvesters, agricultural machines, construction machines or solar collectors. The robust housings are IP68 rated and enable a long-term stable and reliable measurement of inclination. The micro-mechanical capacitive measuring element of the sensor guarantees high accuracy and sensitivity with a repeatability of 0.1 percent. The standard program includes biaxial inclination sensors in cuboid-shaped housings, Q20L60, covering angular ranges from +-10, +-45 and +-60 degrees. The sensors are available with voltage, current and radiometric outputs. Turck also offers another model in a Q42 housing with CANopen interface. For special applications, the sensor family also offers uniaxial models operating in the full angular range of 360 degrees. The user can adjust the desired range in just a few seconds. The 360 degree versions are available with analog, voltage and current outputs, as well as with two programmable switchpoints.

more on page 6

Safety Light Curtain with No Dead Zones

▶ A compact, low-cost Type 4 Safety Light Curtain has been introduced by Turck. The new EZ-Screen LP (Low Profile), developed by Turck's strategic partner Banner Engineering, provides continuous protection for the entire length of the screen with no dead zones. Its two-piece design (emitter and receiver) with integrated controls eliminates the need for a separate controller. Units are available with 14 mm resolution for finger detection or 25 mm resolution for hand detection. Protection heights range from 270 to 1,810 mm, with detection range up to 7 m and response times of 8 to 43 ms. Setup is easy without a PC, using DIP switches, a seven-segment LED display and a bar graph indicator showing diagnostic information. Continuous beams can be blanked for situations where part of the machine would block the curtain. Screens are available in safety yellow, brushed anodized aluminum for a more aesthetic appearance where yellow is not required, and a nickel plated ESD (electrostatic discharge) safe housing for semiconductor applications. The 28 x 26 mm housing profile fits on small machines with minimal protrusion.



Intrinsically Safe Profibus-Gateway

▶ Turck now offers a new intrinsically safe Profibus-DP gateway for its **zone 1 remote I/O system, excom**. At the core of the GDP-IS is a new microcontroller that enhances the performance remarkably and enables an even better availability of the complete system. Due to their 100 percent downward compatibility, already existing gateway variants can be replaced by the new solution. In spite of the new functionality, the GDP-IS has a lower dissipation loss, because the power consumption is 1W at maximum. The GDP-IS offers additional status information and special excom error codes, such as for power supply, projection and HART communication errors, next to the usual diagnostic tools, including the channel related diagnosis. The gateway to gateway communication that is needed for redundancy operation takes place over a separate interface. For communication with the modules, the gateway provides two full-fledged controllers. excom is a remote I/O system for use in hazardous areas. It offers IP20 rated bus compatible, local in/output modules to connect binary and analog field devices that are intrinsically safe.

iVu Vision Sensor Series Extended

▶ A versatile **DataMatrix/bar code reader** that is easily configured from a touch-screen is the latest addition to Turck's iVu vision sensor series. The new iVu BCR comes from Banner Engineering and reads DataMatrix and all standard linear bar codes. It includes the ability to read multiple codes of different types in the same image. The menu-driven interface and 68.5 mm color LCD touch-screen controls (320 x 240 pixels) allow easy setup and changes to inspection parameters. Turck has introduced **remote display versions** of both systems to extend the capabilities of its iVu BCR bar code reader and the iVu TG image sensor. Designed for applications where the sensor must be placed in a difficult to reach location, the new units allow setup and inspection monitoring to be done at a remote control position. Applications for the new sensors are found in a wide range of industries, including automotive, packaging, material handling, pharmaceutical, plastics, electronics (PCB and assembly), appliances and metalworking.

20 Years Turck in Beierfeld

▶ This summer, the Turck group will celebrate the 20th anniversary of its production and development site in Beierfeld in Saxony. The location isn't just producing the typical Turck products, it is also an innovative

EMS-service provider by producing and developing customized electronics with duotec, a sub company of Turck. duotec uses the existing development capacities and manufacturing technologies to offer a wide range of electronic solutions for innumerable fields of applications.

more on page 36 ▶

RFID-Trends

▶ In cooperation with **Volkswagen** and the **AIM e. V.**, Turck presented the latest trend in automotive RFID at the CeBIT tradeshow in Hannover. Many visitors took the opportunity to see how industrial processes could benefit from automatic identification technologies. The German car manufacturer, Volkswagen AG, and Turck used a VW Passat CC sectional model and assembly components to show how to increase transparency in production and logistics by typical RFID-operated processes.

▶ Webcode **more11010e**

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Webcode | **more11000e**

Turck's inclination sensors are available in a compact design

Get an Angle on it

Robust inclination sensors from Turck allow reliable inclination measurement up to 360 °

Whether for steering a harvester, an agricultural or a construction machine, for the surveillance of ships, vehicles or airplanes, or for the control of vending machines, robots or solar plants, sensors for measuring and surveying inclination angles make the operating procedures more safe and efficient. Since safety and efficiency are important competitive factors, the request for inclination sensors that are easy to operate is rising constantly. For the sensor specialist, Turck, this was a reason to develop a whole inclination sensor family whose members are able to measure nearly every inclination angle.

The technology

An inclination is the relative position of a course, compared to the horizontal or to the vertical axis. Changes from this position can be measured fast and accurately with inclination sensors. As a reference for the measurement of the inclination angle, the gravitational acceleration is measured. This measuring principle equals the use of a plumb-line, where a mass orientates itself at the gravitational field.

The inclination sensors by Turck are based on the so called MEMS-technology (micro-electronic mechanical system). At the core of the construction is a micro-mechanical capacitive sensor element, consisting of two parallel horizontal plate-type capacitors. A plate-type capacitor consists of two parallel conductive plates. If a direct voltage is used with both plates, they charge until the electrode voltage is the same as the direct voltage. In doing so, the voltage of the capacitor is proportional to the direct voltage. The quotient from both values is the capacity.

Both plate-type capacitors from Turck's inclination sensor family use a shared middle plate, which forms a micro-mechanical pendulum. If the sensor is accelerated or brought out of its plumb position, the shared middle plate adjusts its position and the capacity of the conductive plates changes. This shared plate is constructed as an elastic pendulum. The sensors work as spring-mass system, whose springs are made of silicon

Inclination sensors are used for jet bridges, as well as ...

... for innumerable construction machines and other vehicles

Quick read

Rising requirements for safety and efficiency for vehicles, machines and plants increases the demand for robust inclination sensors that are easy to handle. For Turck, this was the reason to introduce its new inclination sensor family whose members measure nearly every possible angle of inclination. There is a sensor for every situation – from the biaxial standard model to a sensor with a CANopen-interface.

In this washing and bleaching machine by Erbatech, the inclination sensor monitors a dancer bar that scans the tension

bars that are only µm wide; the mass is also made of silicon. Through the displacement between the spring-loaded part and a fixed reference electrode during the acceleration or the inclination, a change of the electric capacity can be measured.

Robust packaging

Next to the measuring cell, the evaluation of the signals and the packaging of the electronics play a crucial role for the reliability and the functionality of the inclination sensors. The sensors have a repeat accuracy of 0.1 percent of the measurement range and a dissolution of up to 0.05 degrees, where the highest precision is needed. Due to the encapsulated electronics, the sensors are rated for IP68 environmental protection. This was proven through long term storage (24h) at -25 and 70 °C, seven days in a dip tank and ten thermal shocks from -25 and 70 °C.

The high reliability and the robust construction of the sensors are as important for the user as is the easy operation and administration. The 20 mm wide design of the Q20L60, and the cubical-shaped design of the Q42, work well in utility vehicles and agricultural machines, as well as in industrial crane technology and in industrial automation. Two diagonal, opposing drill holes in the Q20L60 and two drill holes on the side of the Q42 allow a fast and safe installation. The inclination sensors from Turck are also useful in systems that perform fast movements and are exposed to heavy impacts.

The sensor family

The new inclination sensor family from Turck offers different designs for different fields of applications. The standard program contains the biaxial inclination sensors. They are available with an analog output for voltage, electricity and radiometric and cover an angular range from +-10, +-45 and +-60 degrees. For special operational areas, the sensor family offers uniaxial models, which are able to cover the angular range of 360 degrees. With these models, the user can adjust the angular range within a few seconds. The uniaxial type is available with an analog output for voltage and electricity.

For the surveillance of critical values, Turck offers another 360 degree version with programmable switching points. With a few clicks on the teach-adapter, the switching and the tripping points, as well as the hysteresis, can be programmed according to the requirements of the application. The LEDs on the sensors show the current switching status.

Highlight with CANopen-interface

Turck's Q42 inclination sensor has a standard CANopen-interface (according to CiA DS-301/category after CiA DSP-410). These models offer baud rates of 10 kBit/s up to 1MBit/s, high sampling rates and bandwidth, as well as adjustable repression of vibrations. All the measured data and the parameters are accessible over the object index. The individual configurations can be saved with an internal EE-PROM non-volatile storage. ■

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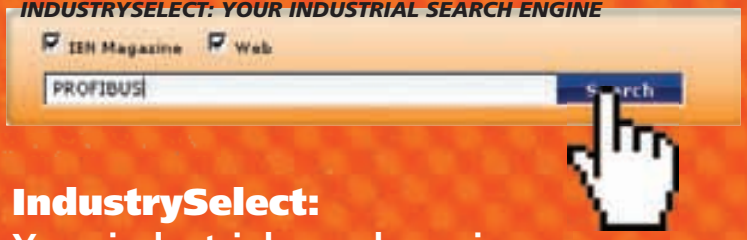

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Klaus Ebinger is looking forward to new members of the IO-Link consortium

"Fine-tuning the IO-Link"

Frank Nolte, assistant chief editor of the trade journal etz, spoke with Klaus Ebinger, Turck's specialist for the IO-Link technology, about standardization and the significance of the technology

In 2009, the IO-Link consortium was represented at the PNO booth at the SPS/IPC/DRIVES tradeshow, which is the exhibition for electric automation technology. What positive effects result from your cooperation with the organization?

At the last two SPS/IPC/DRIVES shows, there was an active interaction between different manufacturers of IO-Link modules. In 2009, Turck displayed our existing range of IO-Link solutions, from masters to devices to chips. The cooperation with the PNO allows us to use their administration so we can concentrate on investing in the IO-Link technology. Another advantage is the new rules of the consortium that are valid from the beginning of this year. To join the IO-Link consortium, you only have to be a member of the PNO and there is no more membership fee.

Furthermore, the IO-Link consortium is its own technical commission within the PNO, but we are still able to work with other fieldbus organizations. This candor is very important to us.

A few exhibitors presented the IO-Link technology at the SPS/IPC/DRIVES tradeshow. How content are you with the development of the technology?

Although the IO-Link technology is only four years old, it is already established in the field of automation technology. One year ago the first applications for the communication system were developed, and it is pleasant to see that the interest of the users has increased in such a short amount of time. The number of members of the consortium is rising constantly. Nearly every reputable German producer of automation technology is a member, and we expect the number of members to rise even more, since there is no longer a membership fee.

What are the current IO-Link products from Turck? What products are you planning to introduce in the future?

At the SPS/IPC/DRIVES show, we introduced an inductive linear displacement sensor and a sensor that is able to recognize welding nuts. In the future, every Turck sensor with an analog output or adjustable parameters will be IO-Link compatible.

In addition to sensors that are compatible with the IO-Link technology, there are also a lot of peripheral devices needed to leverage the technology. What is the situation with the connection to drive, regulation and control technology?

The members of the consortium are constantly working on the development of the IO-Link technology, and we are quite successful with the sensors and the masters. Actuators still need to be developed further. So far, only Bosch Rexroth and Gemü offer appropriate actuating elements. Festo is currently planning to launch products with an IO-Link. Additionally, we are currently talking to some manufacturers of drive technology who are interested in joining our consortium.

Software tools are needed to plan the networks and to analyze the data. Are there standardized engineering and development tools available?

There are existing tools, like the integration over a GSD data file, that make small IO-Link networks possible. Some producers have developed company-specific solutions for more complex systems. Because the IO-Link is supposed to be an open communication protocol, technicians are working on different tools to make the handling of the communication system easier for the user. For example, a generic DTM has been developed that creates a DTM out of every IODD of an IO-Link device. This compiler will enable the configuration of all devices with a tool like PACTware – impartial to the network or the controller.

Is there a plan for formal standardization?

The IO-Link is submitted with the German DKE for standardization. At the moment the board is working on the IEC standard.

If you look at the members of the IO-Link consortium, it is obvious that the technology has most of its followers in Germany. How is IO-Link received in the rest of Europe, in the United States and in Asia?

One of the main topics of the IO-Link task force is internationalization. In Germany, we put a lot of our efforts into marketing. We went to exhibitions and wrote a lot of articles for technical journals. Now we want to spread the IO-Link technology all over the world. There is already interest in Europe, primarily in the Netherlands, Belgium and Italy. In those countries and in the United States, we are planning to promote the IO-Link technology with presentations, roadshows and training courses, among other things. The interest for the IO-Link also grows within the producers of automation technology outside of Europe. Banner, NEC and Mitsubishi Electric are already members of the IO-Link consortium.

Are you planning to approach the Asian market?

The Asian market is strongly occupied by CC-Link technology at the moment. We can not work the market on our own, so it would be of great help if the Japanese fieldbus organization would participate in the IO-Link consortium. However, my Chinese colleagues are really interested in IO-Link technology. This is no surprise, considering that there won't be the need for multicore-lines for the signal processing of a compact machine with sensor technology and actuating elements any longer. With the IO-Link you only need a three wire standardized line. ■

"In the future, every Turck sensor with an analog output or adjustable parameters will be IO-Link compatible."

Klaus Ebinger

"The physics of the IO-Link works. We have shown that with our Multi-Vendor-factories. Now we are fine-tuning the technology so the user can adopt it easily."

Klaus Ebinger

Author

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www.etz.de

Webcode | **more11030e**

Automation to Go

At the Vision Application Park visitors can witness the automatic transformation of their order into a customized product in a multi-vendor machine

Author

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Webcode | **more11031e**

In cell number 1, a palletizer from Hirata provides the Playmobil characters and circulates them with the help of a Hirata robot

For the Vision Application Park at the tradeshow in Hannover (booth B24, hall 17) the hosts (Vereinigte Fachverlage Mainz), which publish the trade journals IndustrialVision and MSR Magazine, will showcase technology from more than 30 associates – among them Turck – from the fields of vision, material handling, automation, packaging and labeling technology. In a large multi-vendor machine, the Application Park shows a multitude of optical test procedures.

The user can see for themselves that there is a solution for nearly anything. The Application Park connects vision, handling and automation technology and offers plenty of information on these subjects. Ten modular test units and processing cells are connected to a transfer system within the machine.

Hirata and Turck in cell number1

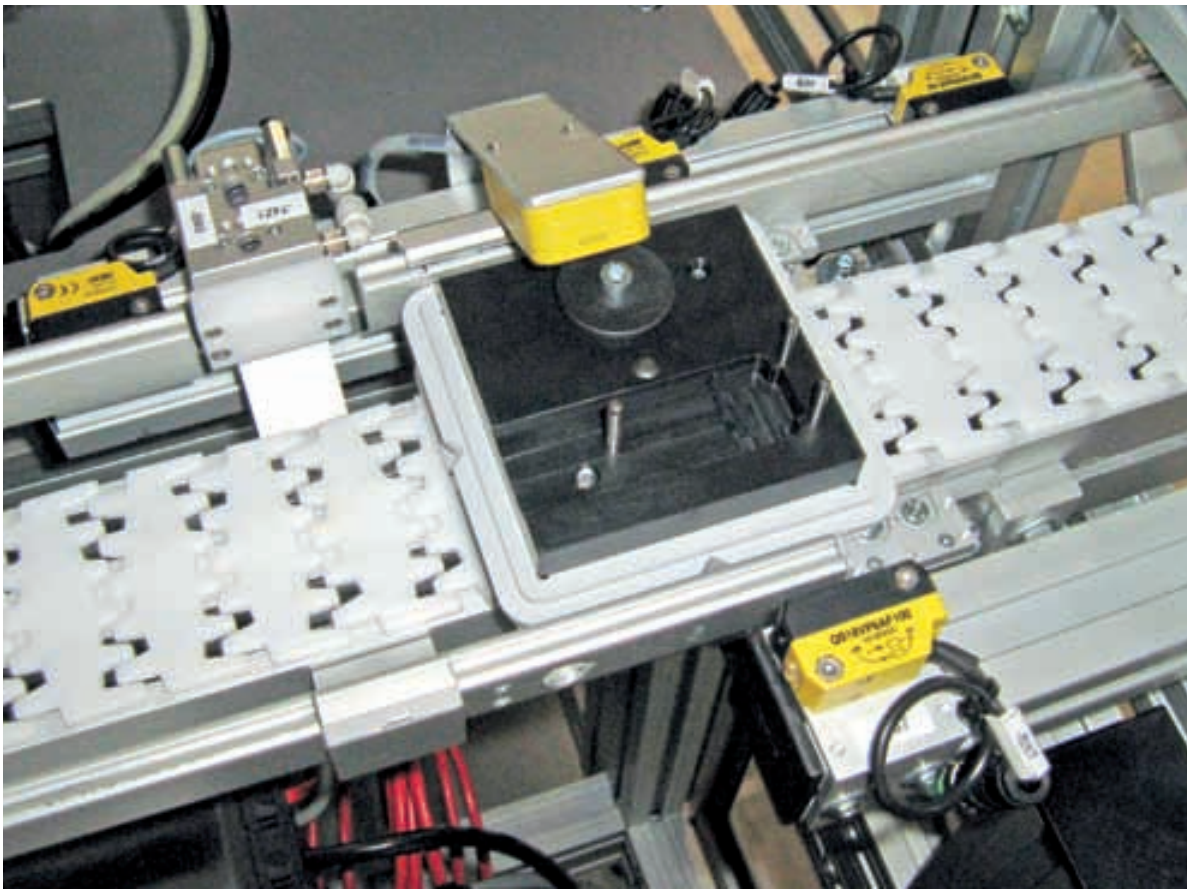
The visitor can choose one out of four Playmobil characters at the entrance of the Vision Application Park – a knight, pirate, firefighter or musketeer. The visitor then receives a ticket to get his Playmobil character automatically at the end of the machine. The order information is imprinted on a work piece carrier with a RFID tag and inserted into the machine. At the entrance of cell number 1, the BL ident RFID system from Turck reads the data and forwards the information via RS232-interface to the robotic controls.

The Playmobil characters are kept in a palletizer from Hirata and are removed with the help of a robotic arm. A camera observes the 27 positions of the trays that contain the different Playmobil characters. Here, the PresencePlus Pro Minicam from Turck's partner, Banner Engineering, comes into operation. The miniature camera is connected to an external controller, which sends the signal via RS232-interface to the PLC of the robot. That's how the robot knows which Playmobil figure to choose. Additionally the controller sends a video-signal to an external screen, so that the visitor can see a simulcast of the tray.

Cell number 1 is illuminated by two white, linear LED panel lights from Banner Engineering. To be able to create a contrast ratio against the normal light in the exhibition halls, the trays are illuminated by two linear infrared lamps.

After the Scara-robot has picked the right Playmobil character, a tag is attached to the back of the figure, which contains the DataMatrix-Code and the name of the receiver. For control reasons, the Scara-

Information www.partners-for-vision.info



At the entrance of cell number 1, the BL ident RFID System from Turck reads the RFID tag on the workpiece

robot places the figure above a DataMatrix/Barcode reader with an integrated ring-lights from Banner's iVu-series. The compact reader is available in two versions, either with a touch screen at the back or with an external display. Since the reader had to be installed with the back facing downwards for this special purpose, the version with the external display was used here.

The DataMatrix/Barcode reader from the iVu family reads the code from the back of the figure

Quick read

At the Hannover Messe, visitors can experience how image processing and quality management in a multi-vendor machine work at the Vision Application Park, booth B24, hall 17. From the initial order, through the various test procedures, to the packaging – the Playmobil characters pass through a realistic test course. Visitors can take their toy home at the end – individually labeled and packaged.

Comprehensive diagnostic program

If the Playmobil figure passed all tests in cell number 1, it passes through the other cells. Here the figure runs through different stations for color recognition and spectral analysis, the inspection for scratches, 3D-recognition and the creation of an elevation profile or the geometrical measuring. All results of measurement can be viewed by the visitors over monitors at the control stations. At the end of the process, the accessories and the tested figure are transported to the packaging station. Finally, a robot without a casing hands the packed figure to the visitor who can take it home as a souvenir. The Vision Application Park is accompanied by a vision nature trail, where visitors receive detailed information about the contents and training opportunities in the image processing industry on presentation boards.

If you miss the Application Park at the tradeshow in Hannover, you can see the multi-vendor machine at three other tradeshows in Germany this year: the Motek in Stuttgart, the Fachpack in Nürnberg or the Vision in Stuttgart. ■

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Cost-saving and convenient: Wireless solutions offer new possibilities for numerous industrial applications

Industrial Wireless

Wireless communication optimizes handling and material flow processes

In industrial applications, wireless solutions are mostly used as cable substitutions because they cost less and may be used in places where it is not possible to use cables. Usually the so-called ISM band (Industrial, Scientific, Medical) is used for wireless, which is approved by most regulatory authorities worldwide. The entire frequency spectrum consists of various frequency bands between 6.7 MHz and 246 GHz. Within that range you can find nearly anything that works without cable, like radar, WLAN, Bluetooth, RFID and locking systems.

Naturally, the question of the reliability of such wireless solutions arises in relation to their ability to withstand interferences and other possible failures. Here, producers are challenged to maximize the availability of their wireless solutions.

By doing so, a few techniques proved to fulfill the industrial requirements, namely the procedure of frequency hopping spread spectrum (FHSS) and the procedure of time division multiple access (TDMA). Both are also used for mobile communication. The procedure of FHSS works with different patterns that change the frequency constantly. In case of a collision with another system, the broadcast will be repeated on another frequency. The procedure of TDMA sends signals from different senders to a communication chan-

nel in specific intervals. With these techniques, various wireless radio systems in close proximity can operate free of interferences. Additionally, they allow power management that enhances the durability, if used with a battery.

A fundamental requirement for the use of a wireless solution is the date transfer quality. It is dependent on transmission power (the transmission frequency of 2.4 GHz is 100 mW in Europe) and environmental circumstances, like protruding objects that are located between the sender and the receiver. The radio systems from Turck's partner Banner Engineering have an integrated display that shows the transmission quality.

More than cable replacement

Wireless communication is more than just a cable substitute, as in the case of a driverless transport system in a packaging station, and the remote fill level control

Quick read

While wireless solutions are commonly used in the consumer sector, the use for the production process and the operation of handling and material flow processes is less established. Today, the wireless communication is as safe as a cable connection, and it can provide much more than just a simple cable substitute.

systems at a rotary indexing table. The communication between the central PLC and and the Automated Guided Vehicles (AGV) makes sense with a wireless solution. In this example, a signal for immediate collection is sent to the AGV after a pallet is fully loaded. As soon as a worker has loaded the pallet, he gives a signal to the AGV to pick up the pallet. It is possible to increase the density of communication with the same system to influence the driving performance, in case multiple transport systems are used. Also, at a higher automation level, the synchronization of movements with stationary materials handling equipment is possible, for example the accessing of signal lights, barriers or elevators.

In the remote fill level example, optic sensors control the filling of a container with a viscous fluid at a rotary indexing table. Switch signals are sent from four different positions to the controls. The power supply for the control unit comes from a separate battery in a box, which is attached to the table. To use the battery efficiently, cycle times and responding behavior of the sensors can be adapted. With the use of wireless solutions, expensive and interference-prone abrasive rings are not needed any longer, which makes the control much more efficient.

Comprehensive wireless portfolio

Turck has a complete wireless portfolio for industrial use in the factory and process automation markets. In addition to its point-to-point solution, DX70, and the network version, DX80, the automation specialist is now offering the new DX99 series with Atex approval for zone 0.

A new solar panel providing a self-sufficient power supply for external devices completes Turck's wireless portfolio. The wireless series, developed by Turck's partner Banner Engineering, is the most comprehensive and flexible wireless solution for industrial use worldwide. Turck's wireless families support various signal types, from analog signals, to binary contacts or frequency signals, to digital protocols via RS232 or RS485. Depending on the individual application, the user may chose between a cost-effective point-to-point solution – a gateway with one node – or a network architecture in which one gateway can operate up to 99 nodes. Turck's wireless solution transmits within the 2.4 GHz waveband and allows safe and reliable wireless communication using the standardized transmission protocols TDMA and FHSS. ■

Transparency for the Conveyor System

Turck's BL ident RFID system provides transparency for the automatic carriage conveyor at the Duesseldorf University hospital

As one of the most important medical centers in the region, the Duesseldorf University hospital (UKD) provides stationary medical care for 42,000 patients and 300,000 ambulant treatments every year. Twenty-nine hospital buildings, located on 400,000 square meters, need a lot of material supplies.

Therefore, the UKD operates an automatic carriage conveyor (ACC) system that consists of 1,100 stainless steel containers that are moved on their wheels. An employee rolls the container from the ward to the ACC. There, the system uses a trolley conveyor to deliver the containers automatically to their destinations.

There are six different types of containers for different purposes. They transport food, laundry, medicine, equipment or garbage from the kitchen, the pharmacy, the laundry, the central store or the center for sterilization to the different buildings and stations. At a central gate, employees place the containers into the system and allot the specific destination of the container over a control panel. They also specify the destination for the return trip so that a container for medicine gets back to the pharmacy and not to the laundry.

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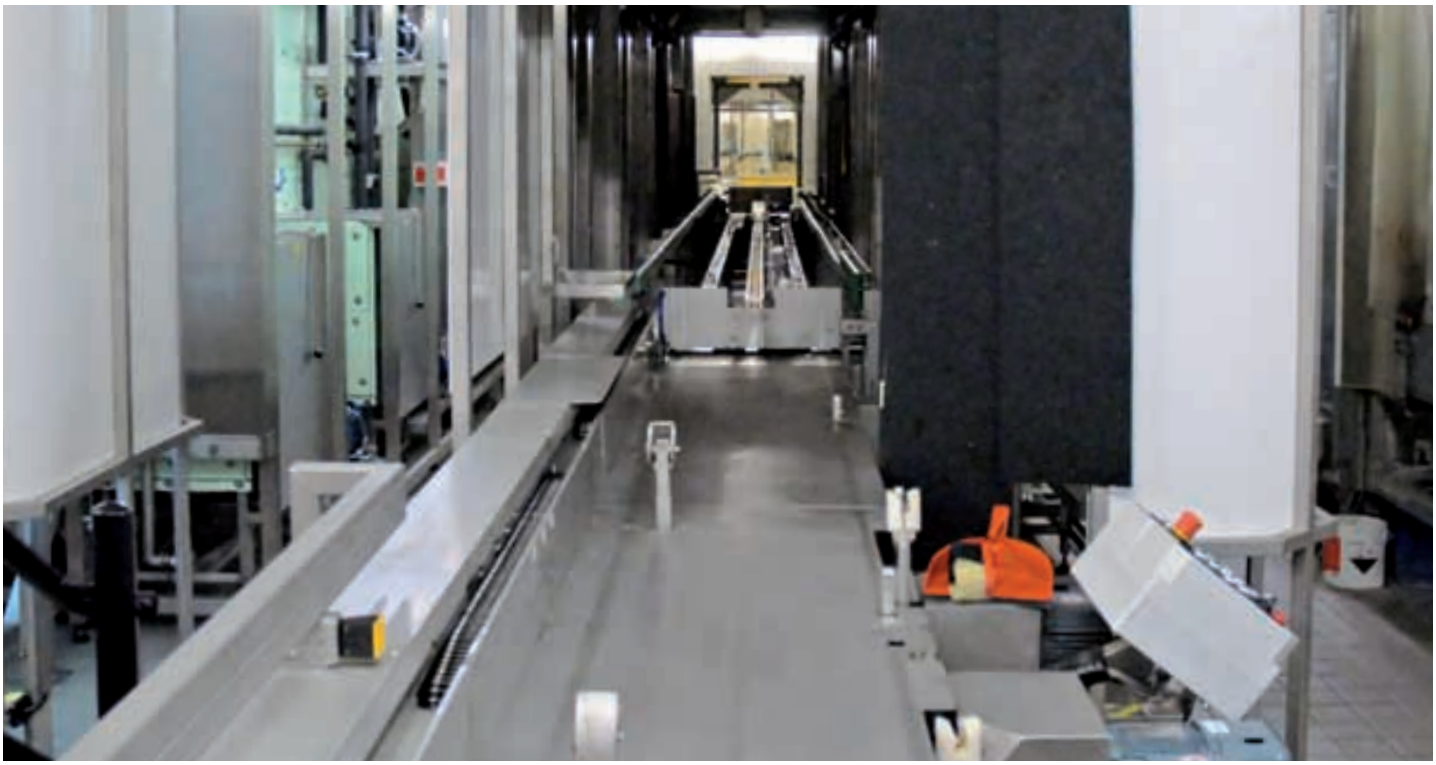
Webcode | **more11050e**

The containers are sliding through the catacombs of the hospital to their destination

User www.uniklinik-duesseldorf.de **Integrator** www.elektro-loeb.de



The RFID tags resist heat and moisture in the washer system for containers

"To ensure an accurate operation of the ACC, the easy handling on the wards is very important. The nurses only have to place the containers into the system. They don't have to pay attention to the destination," says Uwe Scherring, chief of conveyor technique at the UKD. "That's why we have provided every container with a RFID tag. This tag contains the number of the container and its type."

As soon as a container gets placed into the system, the RFID system by Turck reads the ID-number and the type. For this purpose, there is a read/write head installed at every gate and at the 39 container elevators. The data is transferred to the gateway on Turck's BL20 modular I/O system, with the help of a special RFID I/O slice. From there, the data gets to the superior control system via Profibus. In addition to the RFID stations at the gates, which are responsible for the regular transports, there is a hand scanner for the individual use near the repair shop to keep record of a repair.

Unlimited transparency

Compared to the easy binary coding, that was used at the UKD before the renewal of the ACC-controls, the RFID technology offers unlimited transparency. Before

Quick read

With the help of the automatic carriage conveyor, the Duesseldorf University hospital ensures efficient logistics on its area, which is 400,000 square meters. To realize the exchange of material between the 29 buildings and the different stations, like the pharmacy, kitchen or store room, containers made of special steel are used. They are moved through the catacombs of the hospital more than 750,000 times a year. The BL ident RFID system from Turck guarantees the required transparency of the system.

The reader reads the RFID tag that is screwed into the protection strip

The containers are identified by the RFID system before

the conversion to RFID, the inductive sensors could only identify the type of the container. "With the new control system, we have all the relevant information and always know where each single container is located, how long it stays at one ward and when it is due to be cleaned because not every container needs to be cleaned after every use. That creates a transparency that enables us to operate the system efficiently," explains Scherring.

Since there are complete records about the transport routes and times now, the RFID data from the UKD is used for further tasks: The European food law in line with the HACCP (Hazard Analysis Critical Control Points) requires documentation of the production and the transport process of food. At a maximum of 20 minutes, the food has to be at the destined ward with a defined minimum temperature. The records of the data also help to lower the costs, i.e. the transport of aseptic products. "Because of the RFID data, we can increase the transport time of the containers for aseptic products. The faster they are, the fewer medical sets of instruments are needed," explains Scherring.

While the destination is keyed into the control pad, the RFID reader (bottom right) identifies the container

At the beginning of the project, the idea was to use a barcode for identification. But this idea was quickly rejected, because of the enormous strain the containers are subjected to during the cleaning process. The washer system for containers uses a 45 °C prewash. The primary wash uses an alkaline cleaner and 70 °C water, and the rinsing cycle uses 80 °C water. In the end, 100 °C hot air dries the containers. In contrary to a barcode, the RFID tag handles this treatment easily.

What doesn't fit, will be made to fit

In the first project phase, the data medium was the biggest challenge. More than 1,100 containers had to be equipped with the new tags and every minute did count. "Elaborate modification measures were out of question," explains project manager Scherring. A solution was needed that would allow a fast and simple modifications.

Although Turck already had a large amount of application orientated data carriers to offer, the ideal solution was not among them: Either they had to screw an unsecured RFID tag onto the framing plastic rail or they

they go into one of the 39 elevators

With the help of a special RFID I/O slice, the data reaches the BL20-gateway, where it gets forwarded to the superior control system via Profibus

had to mill an entry slot into the rails, which would have been too intricate.

In close collaboration with the company Elektro Löb from Moenchengladbach, who served as a system integrator for this project and who was responsible for the planning and the realization of the 'ACC-controls', the idea was born to unscrew one of the metal targets from the old system and screw the new data carrier into the old thread. After the developers from Turck checked this idea and found a possibility to integrate the data carrier into the thread and seal it, an efficient solution was found last year.

"Turck convinced us and our system integrator, Elekro Löb, with its RFID solution immediately. Not only because of its compatibility and the availability of the components, but also because of the flexibility during the development of a data carrier that completely met our requirements," says Scherring. "The company put a lot of effort into this project and offered a perfect solution in the end. Other providers didn't show that amount of flexibility or a sufficient compatibility to our already existing systems." After Elektro Löb had planned, programmed and installed the new RFID-supported controls, the company put the project into operation. A few months later, the changes were completed and the whole system was converted to RFID tags. There have never been any problems or malfunctions with the new system.

But there still is one last challenge to master: About 20 percent of the transports are sent to one of the old buildings that are not connected to the ACC-system so far. The containers are collected at a chute and picked up by low-floor vehicles that bring the containers to the buildings. To truly be able to record all the routes of transport and the transport time, these containers need to be measured as well.

Complementary UHF-components

While the ACC-system records all movements and directs the objects past the read/write head in a defined distance, there are different distances at the chutes and at the hand-over points at the buildings. At times, the distance can be up to 1.50 meter. The HF-technology that was ued doesn't cover those distances, so there was a need for UHF-technology.

Here, another advantage of Turck's BL ident system shines through, because the HF and the UHF components can operate at the same time. It is sufficient to equip the containers with an UHF data carrier and to install an UHF reader at the hand-over points. But the better coverage also means that there is a higher sensitivity to disturbances because of the high frequencies that are used. Together, Uwe Scherring, Elektro Löb and Turck will work on this problem to find a satisfying solution. ■

▸ Turck sensors ensure operation

Next to the BL ident RFID system, sensors from Turck guarantee the smooth functioning of the automatic carriage conveyor. Inductive sensors are installed at the guide rails of the system to recognize oncoming transports. Safety light barriers and ultrasonic sensors from Turck control if an objects sticks out of the elevators or if the doors are locked properly.

"Turck convinced us and our system integrator, Elekro Löb, with its RFID-solution immediately. Not only because of its compatibility and the availability of the components, but also because of the flexibility during the development of a data carrier that completely met our equirements."

Uwe Scherring, Düsseldorf University hospital

Author

Stephan Auerböck is the sales director of Turck Austria in Vienna

Webcode | **more11051e**

Several hundred dual sensors operate at the GAW plants for years

User www.gaw.at

Quick read

The Austrian plant manufacturer, GAW Technologies, is known worldwide for its reprocessing plants for chemicals and coating colors for the paper and cardboard industry. To monitor the status of their innumerable valves efficiently and reliable, the company relies on dual sensors from Turck.

Dual Sensors

The Austrian plant manufacturer, GAW Technologies, relies on dual sensors from Turck for position feedback of their valves

For more than 60 years, the name GAW stands for capacity and quality in industrial plant manufacturing. The family enterprise, based in Graz in Austria, is the center of the international operating group of companies – GAW Group – whose activities concentrate on four different business areas: paper and cardboard, automobile, chemical and environmental technologies. The GAW group offers procedural solutions for all of those areas, beginning with research and development, consulting, engineering and manufacturing, to logistics, construction and start-up, to training and after sales service. All the solutions are customized.

In1951, Erhard Pildner-Steinburg founded GAW (Grazer Armaturen Werke) as an individual enterprise for the production of special valves. It quickly developed into a worldwide market leader for procedural plants. Today, the focal point is the development and construction of coating color machines and reprocessing plants for chemicals for the paper and cardboard industry. With 130 employees, the company has a transaction volume of 35 million Euro. While the Austrian paper and pulp industry was in the foreground in the early years, the market slowly relocated to Asia. These days, the family enterprise (the Voith-group holds a share of one-third of the business) makes 80 to 85 percent of its deals in China. India and Korea also rank among the most important markets.

Innumerable valves

In the reprocessing plants, fresh water, waste water and chemicals that are needed for the coating color and other machines are processed. Therefore, the plants need a large amount of pneumatic and manual shut-off valves and ball valves. For a smooth manufacturing process, it is necessary to receive as many status reports about every single valve as possible. In 2003, GAW was looking for an economic and secure solu-

The terminal chamber with a removable terminal block allows easy installation and maintenance

Even dirt or moisture can't harm the encapsulated dual sensor

tion for the final surveillance of their instruments. Turck was the answer for the pneumatic valves.

Usually position feedback is handled by sensors in expensive and complex individual cases. Turck uses a dual sensor instead that easily attaches to the top of the power unit. "The dual sensor by Turck meets our requirements perfectly", explains the purchasing manager of GAW, Josef Eder, who has also worked in project management for GAW. "Especially the integrated terminal chamber of the sensor and the simple construction were the reasons why we chose the products of Turck. They have a lot of well thought-out details like removable terminal blocks and the connection for electromagnetic valves."

The terminal chamber allowed GAW to reduce the amount of device types, resulting in less complicated purchasing and storage. Furthermore, the sensors are easier and faster to install, compared with models that need a fix wiring. The customers of GAW benefit as well, because the regular maintenance of the engines is much faster and more secure with the removable terminal blocks. Without the terminal block, every single lead needs to be disconnected and reattached. That takes a long time and easily leads to errors.

This is not the situation with sensors from Turck. The single connections stay fixed and the opening of the terminal chamber separates the terminal block from the electronics. A protective cover guarantees that the electrical connections are re-established again by simply closing the case. Next to the status reports of pneumatic actuators, GAW uses sensors from Turck also for other applications. Several hundred two-way sensors operate at the GAW plants.

Competitive factor: Proximity to customers

The product characteristics are not the only reason why the Austrian plant manufacturer relies on the dual sensors from Turck. Explains Eder, "The spare parts distribution is easy, as well because Turck's products are available worldwide. The company always has reacted fast and straightforward to our special wishes and requirements, like with DC-two-wire-electronic or special actuating elements (puck) that can be used for both directions of the drive. We got to know Turck as a reliable partner that supports the optimization of our plants actively. Therefore, we will choose Turck as our supplier for future times as well." ■

"Especially the integrated terminal chamber of the sensor and the simple construction were the reasons why we chose the products of Turck. They have a lot of well thought-out details like removable terminal blocks and the connection for electromagnetic valves."

Josef Eder, GAW Technologies

Author

Jochen Mark is a sales specialist at Turck Germany in Mülheim

Webcode | **more11052e**

At a glance: The inductive uprox sensors by Turck recognize the chassis of the transport boxes; light emitting diodes indicate the status

User www.fraport.de **Integrator** www.seap-automation.com

Luggage Inspection at Frankfurt Airport

At the automatic baggage transportation system in the Frankfurt airport, inductive and optical sensors guarantee a smooth operation

The airport in Frankfurt (operated by a company called Fraport AG) is one of the biggest airports worldwide. Nearly 150,000 passengers use the airport every day. For more than half of the passengers, the airport is only a transit station. Most of them take connecting flights within 45 minutes. To ensure that the luggage of the passengers find its way into the right airplane fast, Fraport AG operates an automatic baggage transportation system, which guarantees the quick loading of the airplanes with a reliability of 99.65 percent. On a transport route of 73 kilometers, the suitcases and bags are transported between the gates on terminal 1, terminal 2 and the ramp position. The average speed is 2.5 meters per second. At a few high-

Quick read

The automatic baggage transportation system in the airport at Frankfurt is unique to the world regarding capacity, quality and performance. On a transport route that is 73 kilometers long, about 18,500 pieces of luggage find their way to their destination within an hour. Inductive and optical sensors from Turck guarantee the reliable identification of the transport boxes.

speed routes in the tunnels between terminal 1 and 2, the speed can increase up to 5 meters per second.

On their way to the airplanes the luggage is checked automatically for security reasons. That happens in multi-level x-ray control stations (MRKA), which are integrated into the transport route. During the last four years, Fraport AG replaced their established system with a new, ultra-modern system that was built by the conveyor specialist Beumer Maschinenfabrik in Beckum. While Beumer was responsible for the mechanical part of the system, control and electrical engineering was assigned to SEAP Automation GmbH in Langen. Owner and managing director Anton Pajonk is experienced regarding the use of control technology at the airport in Frankfurt. He already participated in the reorganization from relays to PLC technology at the end of the 1980's. He founded his own company in 1992, which has grown up to 25 members of staff. Besides customers from the airport sector, SEAP Automation also serves reputable automobile manufacturers and component suppliers.

The first MRKA was built in 2006 for terminal 2. A year later the system was installed for terminal 1 as well. Both systems were equipped with control technology from SEAP Automation, which planned and constructed the system, including a new sensor system that provided optimal surveillance. "We integrated about 1,500 control driven components into the redundancy system and the new interline-system of the transport route," estimates Pajonk. "The number of the sensors used is about 5,000, including various proximity switches, light sensors and safety light barriers from Turck."

The proximity switches are used to detect the oncoming transport boxes and their transport chassis.

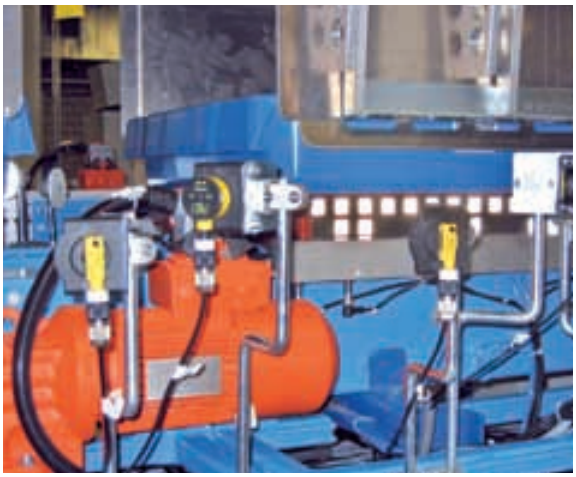
Foolproof identification: The code-reading station from Turck reads the reflector's code at the left side of the chassis

The chassis is made out of metal and it carries a transport box made of synthetic material, which contains one piece of luggage at a time. To be more flexible with the process, and to be able to separate the transport box and the metal chassis for the security x-ray, a split solution was installed in Frankfurt. While a barcode is attached to the boxes, the chassis is equipped with reflectors that allow an easy identification on the basis of the so called Hamming-Code. The Hamming-Code is a linear block code that allows an automatic error correction, which makes the machine very reliable.

Setting the course

The new conveyor belt system uses about 100 conveyor switches that direct the transport boxes to their final destination. In front of the switches, a barcode scanner reads the barcode attached to the boxes, while an opti-

The reading station that Turck built for SEAP Automation contains a light sensor and three light barriers



Smart: The ball-and-socket joint rack allows an alignment in X and Y direction

"Thanks to the special ball-and-socket joint rack from Turck, which allows an alignment in X or Y direction, the construction was done quickly. We were able to save a lot of time and money."

Anton Pajonk, SEAP Automation GmbH

cal code-reader station reads the reflector's code which is attached to the outside of the chassis. For the managing director of SEAP Automation, Anton Pajonk, optical code-reading is an easy, approved and reliable technology. "Other airports often use the tracking-procedure where the data of the chassis needs to be compared with the data in the PLC. In contrary to this procedure, we can read the data from the boxes all the time with the help of our code-system, so that errors don't occur," says Pajonk.

Code-reader stations by Turck

The code-reader stations that were constructed by Turck in close cooperation with SEAP Automation are equipped with optical sensors from Banner Engineering, one of the partners of Turck. Each station contains a light sensor which detects the box, and three light barriers which recognize the reflector's code. "Based on the good experiences with the inductive proximity switches of Turck, we also used the optical sensors from Turck for the new code-reading stations," comments Pajonk his decision. "Because of our good cooperation and the intense support from the staff of Turck, we were able to realize our ideas and present a high performance solution."

In addition to the optical sensors that are integrated into the reading stations, SEAP Automation used light curtains, light sensors and barriers for the transport route. While the light curtains are used to check the luggage overhang and the height control, the other optical sensors ensure a smooth operation of the system by recording every oncoming transport box and giving the signal to accelerate or slowdown the box if needed. This procedure ensures that there aren't any collisions.

The construction and the exact arrangement of the optical sensors were special challenges that only could be solved with the special ball-and-socket joint rack from Turck. "To adjust the optical sensors accurately, we usually would have needed an expensive and time-consuming construction. But thanks to the special ball-and-socket joint rack from Turck, which allows an alignment in X or Y direction, the construction was done quickly. We were able to save a lot of time and money," explains Pajonk. ■

All information is collected at the control center of the automatic baggage transportation system in the airport

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Offshore-Sensors

Streicher uses ATEX-certified, inductive Namur-sensors from Turck for its offshore drilling rig

Even with the decline of the resources, the market for oil and gas is still vital, which means that the petroleum industry has new challenges to face. They have to find access to new oil. Especially offshore, specialists suspect there is enough oil to make drilling profitable, even with the rising price for oil. Due to the offshore-boom, oil companies and plant manufacturers are building new platforms, and refurbishing existing offshore platforms.

The Streicher group, located in Deggendorf, Germany, is currently building its first drilling rig that can be used in water. The company has many years of experience in the development and production of rigs and platform technology. Their range of services in the rig and platform technology includes machines for deep drilling for petroleum, petroleum gas and geothermal energy, as well as horizontal drilling machines for the laying of piping without the need to dig. One of the most important customers for Streicher is their subsidiary company DrillTec GUT GmbH Großbohr- und Umwelttechnik, that is established in the field of exploration of hydrocarbon and geothermic resources and as a company for HDD-major projects.

Modular concept

For a long time, Streicher developed and produced only onshore-construction projects, but about two years ago, the company started to develop and construct their first offshore solution. This solution was ordered by a Norwegian company named Seawell, a well established drilling and well services company. The benefits of the of the Streicher construction is its modularity and the maximum weight of 11 tons per module, which ensures that the cranes on the platforms are able to lift the modules onto the platform safely.

Therefore, the construction is especially suitable for updating and exchanging older systems. "In the North

Author

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Webcode | **more11053e**

Ten inductive sensors measure the current status of the pipe handler

User www.streicher.de

The ATEX-certified Namur-sensors from Turck have to defy the weather conditions of the ocean

To be able to operate two inductive sensors in close proximity, Turck developed a sensor with a shifted oscillator frequency

Sea, there are plenty of old platforms where the drilling rigs are not efficient any longer," explains Hans-Peter Murr, who is responsible for the automation technology in the field of platform and rig technology. "To update those machines and adept them to the newest standards would be extremely expensive, so it is cheaper for the customer to install new machines and constructions on the platforms."

Employees assemble the single modules in a hall at the Streicher premises in Deggendorf first. After those preparations, the whole construction is built on open-air ground. After function and security checks and a training course for the customer, the construction is disassembled again and finally delivered to its destination. "With our modular concept, old offshore platforms can be converted to a new standard faster than with any other solution," says Murr. "The whole construction is tested, which guarantees high safety and only few disturbances at the start-up. The modular concept allows a fast installation on the platform within twelve days."

Namur-Sensors for the Ex-area

To measure the final positions of the innumerable movable elements on the oil rig reliably, Streicher uses inductive sensors from Turck. About 60 sensors are used for the new construction. The cuboid-shaped proximity switches have a higher operating distance of 20mm on steel targets and fulfill all requirements for the offshore use. The Namur-sensors are approved for the ATEX category II 2 G, Ex-Zone 1 and fulfill the SIL 2 criteria in accordance with IEC 61508. Because of their special terminal chambers, the sensors are easy to install. "We already used sensors from Turck for our onshore-constructions, because the company was one of the first manufacturers that could support us when it came to SIL and offer ATEX-able SIL 2 sensors," Murr explains. "Until now everything is going smoothly, Turck has not disappointed us."

Solution-orientated partner

Turck could not only prove itself because of the reliability of its products, but also as an innovative, solution-orientated partner, especially when it came to a special challenge. To meet the SIL3- requirements, it was necessary to operate two parallel SIL 2-sensors at the drilling construction to check and monitor the position. Since the space in such construction is very small, the sensors had to be installed close to each other. This usually brings complications because inductive sensors influence each other.

"Turck supported us very well by constructing a sensor with a shifted oscillator frequency, so that we could install and operate two inductive sensors within close proximity without any problems. To recognize the changes of the sensor electronics at first sight under the tough offshore conditions, Turck marked the sensors with a different color," says Murr. "And because of the good cooperation so far, it was easy for us to continue our teamwork with Turck for the current projects." ■

"Turck supported us very well, by constructing a sensor with a shifted oscillator frequency, so that we could install and operate two inductive sensors within close proximity without any problems."

Hans-Peter Murr, Streicher

Quick read

To upgrade old offshore platforms in the North Sea to the newest standard, Streicher developed a drilling rig that is cost-saving, easy and safe due to its modular system and the maximum weight of 11 tons per module. ATEX-certified, inductive sensors from Turck measure numerous end positions.

Author

Kirk Larson is a regional sales manager at Turck USA in Minneapolis

Webcode | **more11054e**

A servo-driven system delivers a throughput of up to 35 cases per minute printed, erected and sealed

35 Cases per Minute

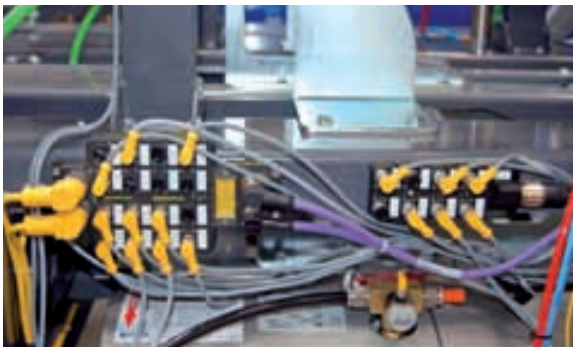
New advancements in packaging system utilize Turck's product portfolio to achieve fast, reliable and customer-focused results

The California location of the packaging specialist Pro Pack Systems makes the company especially appealing for a multitude of local fruit and vegetable producers. The plants in these industries are often kept a cool 34 degrees F, because of the delicate nature of the products. Pro Pack has designed their equipment with IP67 rated products to provide reliable operation in these locations.

According to Paul Zurlinden with Pro Pack, "The products we use in our equipment must have good seals to resist harsh air quality due to the chemicals used for sanitation that can be found in a lot of our customer's sites." The company's insight into customer needs results from 17 years in the business; seven of those dedicated to developing and manufacturing their own packaging machines.

Leap of technology and productivity

To meet customer requirements and industry demand, Pro Pack developed their latest packaging machine, the Pro Print/EBS-HS-2, that will print, erect and seal a corrugated shipping case. Where traditional case erector machines don't provide custom printing solutions at all, Pro Pack's machine can print on all four sides of a case, including bar codes and labels, prior to it being



Turck Profibus AIM stations are used for I/O acquisition and control

BL20 I/O systems installed within the subassembly give users control and diagnostics on the machine

A custom-built encoder with a d-sub connector was designed for Pro Pack's new machine

erected, providing a higher resolution image. Pro Pack realized that printing inside the machine also saves additional floor space required for traditional post-pack printing that may also include bump-turn methods and extra hardware cost.

A servo-driven case opening/squaring system delivers throughput of up to 35 cases per minute. Printed and erected cases are discharged either automatically or on demand with the case oriented vertically, not horizontally, to facilitate manual or automated packing. But what really makes this system unique is its ability to conduct all these steps with one machine, instead of requiring separate pieces of equipment on the packaging line.

The development of the Pro Print/EBS-HS-2 didn't happen overnight; instead it went through two major machine design stages and months of research, design and development. Advanced technology had to be implemented to turn the concept into reality. "In the past, the equipment was much less sophisticated. Now it includes more technology for higher flexibility including a dynamic servo system and more I/O," says Zurlinden.

To achieve their production objectives, Pro Pack began using Turck proximity sensors, pressure sensors to detect air and vacuum, I/O stations and cables to connect the devices to the stations and the modules to the processor for its Pro Print/EBS-HS-2 machine three years ago. Turck's BL20 stations are also used in the control subassembly to retrieve and process I/O data. Likewise, Pro Pack utilizes Turck AIM (advanced I/O module) stations on the machine for I/O acquisition and control. Both of these systems are available in network protocols most often required by Pro Pack customers – DeviceNet and Profibus – so that the machines can be designed to suit the manufacturing environment in which they'll function. "The fact that Turck offers many products with many different network protocols makes it easy for us to use them on our equipment," adds Zurlinden.

Reduced assembly and startup time

Pro Pack produces approximately 20 pieces of equipment each year, each with subassemblies on the machines to give users control and diagnostics at the point where it's needed most. According to Zurlinden, a real advantage of integrating these stations on the machines is the reduction at in-house assembly and startup time at the customer site. "Networking our I/O reduces our assembly time with minimal conductor terminations," says Zurlinden. "We also provide service and start up support to help our customers with installation, along with training employees about how to operate and troubleshoot our machines. A networked system offers fewer wires and simpler troubleshooting."

With the exception of the BL20 system, most Turck products that are used in the Pro Pack equipment are IP67 rated, further ensuring the machine's reliability in the field. Confirms Zurlinden, "I can't say that we've ever had problems with a Turck product. The reliability is outstanding. We also receive excellent service and support from the company. It's nice to be able to go back to the same supplier and not have to shop around."

Thanks to Turck's flexibility in manufacturing, Pro Pack was also able to have custom needs met. Turck was able to provide the company with an encoder with a custom cable connection for its Pro Print/EBS-HS-2 machine. A hollow-shaft encoder with a d-sub style connection was required for the integrated printing system within the machine, and Turck was able to respond to the request easily with minimal up-charge or lead time. ■

"I can't say that we've ever had problems with a Turck product. The reliability is outstanding. We also receive excellent service and support from the company."

Paul Zurlinden, Pro Pack Systems

Quick read

Pro Pack Systems, Inc. in Salinas, California, designs and builds custom case erectors and packers for manufacturers across many sectors. Their latest packaging machine, the Pro Print/EBS-HS-2, includes a lot of technology to turn their concept of a flexible packaging and printing solution into reality. To ensure safe operation in harsh environments, the Pro Pack engineers trust in Turck IP67 rated proximity sensors, pressure sensors, I/O stations and cables, as well as BL20 I/O stations.

Author

Andrew Newstead is a technical sales representative at Chartwell Automation in Edmonton, Canada

Webcode | **more11055e**

Enerflex chose Turck's armored 8 port process junction blocks with 7/8" connectors

User www.enerflex.com

Plug & Work

Turck's hazardous area quick disconnect wiring system and the BL20 remote I/O system support the modular concept of Enerflex's production facilities for oil and gas

The Canadian oil and gas company Enerflex, based in Calgary, Alberta, has divisions for both services and products. While the service side lists instrumentation and controls, as well as mechanical services for compression in its offerings, the products side includes oil and gas production processing, compression and environmental services. Enerflex Production and Processing (P&P) is responsible for the design and construction of complete, ready to commission modular production facilities for the oil, natural gas and chemical industries. Products, such as line heaters, liquid separators and even full amine sweetening and dehydration plants are offered.

Enerflex P&P, located in Nisku, Alberta, has sold products to China, Pakistan, Oman and the United States, just to name a few. When a plant is built in

Quick read

The Calgary based oil and gas specialist Enerflex initially builds its modular production facilities to test the systems and pre-commission the facility, before it will be broken down into container sized loads for shipping. In order to realize the benefits of this modular concept, the Enerflex engineers rely on Turck's hazardous area quick disconnect wiring system and the BL20 remote I/O system.

western Canada and needs to go to Oman or other locations far and wide, it will need to be modular, so it can be broken down into container sized loads for shipping efficiency. Enerflex has been able to design the mechanics of a plant to break down into container sized parts for years using flanges and brackets, but the instrumentation has always been a trade-off.

The company wires the plant in the factory, which allows them to test the control systems and pre-commission the facility, but all that wiring needs to be disconnected from the instruments and rolled back to the points where the modular sections (skids) are joined. This wiring, unwiring and rewiring at the final construction location is time consuming and very costly, when you need to fly skilled manpower around the world and house them in a foreign country while the plant is completed and commissioned. Additionally, there is always the issue of wiring mistakes occurring throughout the process that can delay the startup further, which can cost thousands of dollars and lost production.

Improving the physical layer

Matthias Reissner, lead engineer of the instrumentation design team for Enerflex P&P, is always striving for continual design improvement. That can come from using a new sensor technology to measure flow, pressure or level, but other design improvements are possible starting with something that has been overlooked for years: the physical layer of the plant. Matthias had been looking for a way to improve upon an old and cumbersome wiring system that had remained unchanged for decades. That system was proven and reliable, but required many man hours to install and did not lend itself to modular construction where components need to be disassembled for transport.

This is where Turck has been able to help. The Turck quick connector system is innovative in that it allows for the use of a rugged connector system to terminate to process instruments in the field and consolidate those signals at a pre-made junction box. From the junction box, a multi-conductor home run cable is installed across skid joints back to a control cabinet. This connector system could solve the issues involved with pre-wiring a facility for testing while gaining the ability to reconnect the system once the component parts were re-assembled at the final production site.

This type of quick disconnect wiring has been in use in factory automation for years, but only with additional approvals it would be allowed for use in a potentially explosive environment. Turck got both an American and a Canadian approval (FM and CSA) on their connector system. Despite strong competitors for Turck in North America, Matthias says, "The decision to go with Turck was made easy because of the complete line of product, as well as the local technical and sales support available."

The first project started in 2008, when an American oil and gas company wanted Enerflex P&P to build a complete amine gas sweetening facility for processing natural gas. The customer wanted a facility ready to commission within four months. The new amine plant has approximately 300 inputs and outputs including discrete, 4-20mA, RTD's and thermocouples. The facility is laid out into four main groups for hardware and I/O. These units are separated by long distances, which

The connection process takes just minutes and saves days compared to the old method of single point wire termination

Comfortable: It took less than a day to complete the task of wiring, configuring and pre-commissioning all 70 instruments on the workbench

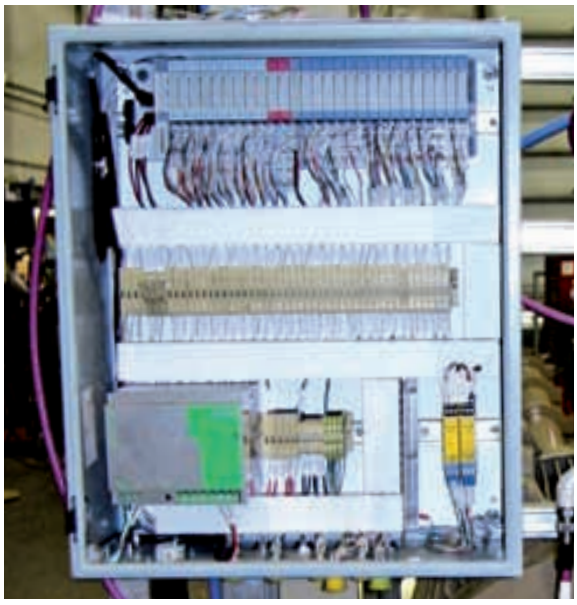
requires large numbers of signals to be sent over 100 meters back to the PLC. Enerflex convinced them that the Turck system would allow the customer a quicker delivery and less expensive start-up.

Quick disconnect and remote I/O

Matthias and his lead process technician Darcy Guderjan decided to use the Turck hazardous area quick disconnect wiring system and the BL20 remote I/O system. BL20 is a cost effective and easy to configure system for process remote I/O solutions in hazardous locations. There are about 150 signals that had to be transferred using a single Ethernet cable back to the PLC from the three remote sections of the plant. They chose BL20 I/O running the EtherNet/IP protocol, which has a worldwide Division 2/Zone 2 approval, to consolidate the temperature, 4-20mA and discrete signals and send them at 100 Mbps to the PLC.

Another major hurdle to cross was the design of the instrumentation wiring on the four parts of the plant. The design needed to accommodate a large number of signals and still reduce the wiring footprint while maintaining the 20 percent customer specified spare capacity. Turck and the Enerflex design team decided to separate the analog signals from the discrete signals for future identification purposes and to conform with what is standard practice in Canada. Enerflex chose Turck's armored 8-port process junction blocks (P-8 RKFV 40-CSV19) with 7/8-inch connectors. They also chose a tray-rated 8 twisted shielded pair cables for signals from the junction blocks to the PLC cabinet and armored single twisted pair cables to connect from the junction block to the instruments.

The instruments are connected to the junction block with armored single twisted pair cables



With Turck's BL20 I/O system about 150 signals are transferred via EtherNet/IP to the PLC

The bottom two ports on each junction block remains open to serve as a 25 percent spare capacity for future use. If needed, the two spare ports could be wired back to the PLC cabinet and could be accessed very quickly, as the wiring is already pre-terminated onto the PLC. This use of pre-made junction blocks reduced the wiring footprint and the amount of cable tray required. There is no longer the need to run all the cables back to the PLC individually, but instead what used to be 8 wires has been combined into one single cable. Because of the small size of the home run cable receptacles, the size of the PLC cabinet, where all the signals eventually terminate, was also reduced, resulting in an additional cost saving.

Wire up on a workbench

For the connector in the instruments, Enerflex chose Turck's CSA and FM approved explosion-proof feed-through receptacles. The advantage of having a connector at the instrument was that Enerflex was able to pre-wire and configure all 70 transmitters before they ever went onto the piping. It was much easier and safer to wire and test an instrument on a warm workbench than out in the cold Canadian winter at -40 °C while 5 meters up a ladder. The efficiency of this process was evident in that it took less than a day to complete the task of wiring, configuring and pre-commissioning all the instruments.

The new system meant that cables had to be measured and ordered based on calculations done with the aid of a new engineering software tool used for drafting layout drawings. Enerflex could not wait for the electricians to measure the finished skid and have the Turck factory in the United States build the desired cables. This process of using the new software design tool was successful with a less than 1 percent error rate. The new cable measurement system worked and the cables were installed with limited difficulty and on time.

The installation of the wiring on the skid went quickly and is easy to trace and troubleshoot. The BL20 remote I/O was configured using Turck I/O Assistant software before it was installed in the remote I/O panels. Once installed in the panels, the instruments were terminated and tested with I/O Assistant before they were connected to the PLC for commissioning. BL20 reduced the cable count and cost significantly compared to conventional point to point wiring.

The PLC cabinet with the Turck home run receptacles was built in a different city and shipped to the Enerflex site to install onto the main skid. When the home run cables from the Turck junction blocks were connected to the PLC cabinet, the commissioning could begin. This connection process took minutes and saved days compared to the old method of single point wire termination as signals were run from transmitters.

Once the wiring, PLC programming and plant commissioning was completed at the Enerflex factory, the entire skid was broken down into smaller sections for shipping. This meant that the home run cables from the junction blocks were disconnected and rolled back to the skid break point and capped off for transport. Once onsite and reassembled by local workers, the process of testing all the signals was very short because of the keyed nature of the connectors. These keyed connectors meant that the job was done with no mistakes, further increasing efficiency and reducing onsite expenses.

Satisfied customer

After the initial two plants were installed in 2008, there have been three other virtually identical plants ordered, all with the Turck hazardous area quick disconnect system specified by the customer. Enerflex was able to increase the productivity of their factory floor by doing multiple parts of the construction process in parallel, as well as provide their customer with a superior product for commissioning and ongoing maintenance. ■

"The decision to go with Turck was made easy because of the complete line of product, as well as the local technical and sales support available."

Matthias Reissner, Enerflex

Once the wiring, PLC programming and plant commissioning is completed at the Enerflex factory, the entire skid is broken down into smaller sections for shipping

Hydraulics Specialist

The new PS300 pressure sensor family by Turck meets the requirements for hydraulics engineering

Pressure sensors that are used for hydraulic systems have to meet specific requirements, but mainly they have to be very robust. Usually the hydraulic pressure is between 6 and 600 bar, but it is dynamic and not static. The constant alternating pressure not only strains the cells and the sealing material but also the housing itself. It is important to choose the right combination of cell technology, sealing material and the housing to ensure a reliable pressure monitoring.

To resist dangerous pressure peaks, which exceed the usual pressure by several times over, the choice of the right cell technology is essential. Pressure measuring cells made of ceramic are approved for these kind of applications. They offer over-pressure safety, a good drift performance and a fast reaction time. Furthermore, ceramic is resistant against aggressive substances.

Therefore, a measuring cell made of ceramic is the core of the new pressure sensor family, PS300, from Turck. This piece of equipment processes the measuring signals directly from the cell and forwards them in digitalized form to the evaluation electronics. That intensifies the positive qualities of the ceramic. The result is better performance when it comes to excess pressure, compared to standard ceramic cells.

High protection category IP69K

The pressure sensor is not only stressed by the hydraulic pipes, but also through outside influences like oil spray, mechanical forces or EMC influences. The PS300 family is rated for IP69K for all areas of pressure measuring. The case made of special steel and the sealed control and display elements don't allow mois-

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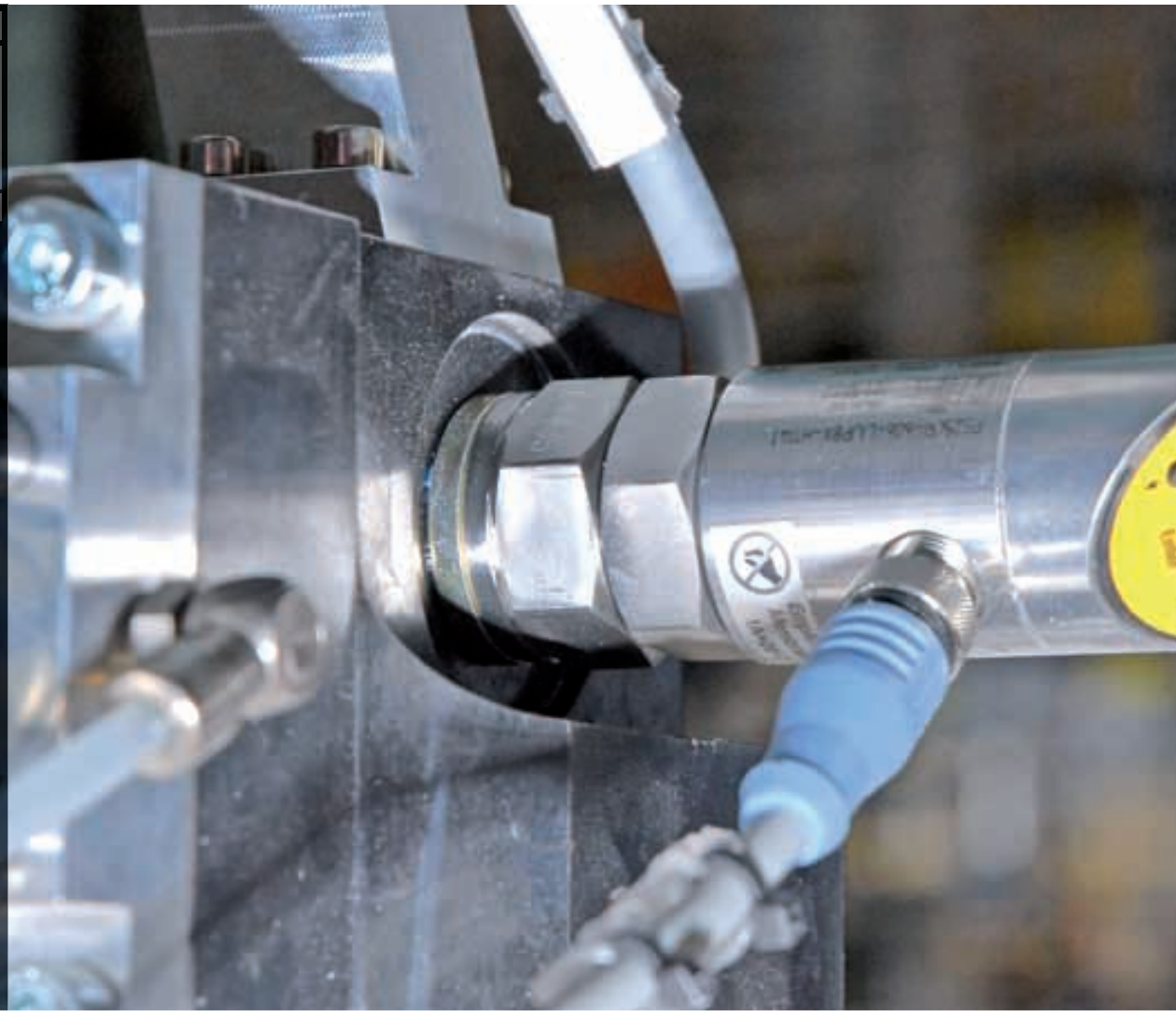

The PS300-sensors are available with G1/4“, 1/4“-NPT and R1/4“ process connection with switching output and analog output for current and voltage

ture into the device. Mechanical forces up to seven joule – even onto the display – don't have any effect. Because of the new cell technology with integrated digitalization of the data, the PS300 reaches a high electromagnetic tolerance as well as a high accuracy of 0.5 percent. The repeatability of sensors like this is mostly underestimated. Often people look at the data sheet for the tolerance and the error information first. What looks accurate at first may not be because temperature, hysteresis and other factors have not been considered.

The reason for inadequate repeatability often results from choosing the wrong material, which cannot guarantee the perfect interaction under pressure and temperature load changes. Naturally, the electronic components play an important role. Turck took this into account and made sure that the new cells had an improved repeatability by working on the signal processing. The signal is no longer analog but digital, which reduces interfering signals that occur through the development of extra-low voltage.

User-friendly

The product characteristics are not the only important factors; manageability is an essential criterion. This includes, among other things, enough space for the use of tools during mounting, sufficient access for the electronic connections and adequate possibilities to program the equipment.

Turck did not compromise and used the same philosophy from its PS400/500 and TS400/500 series in the new pressure sensor family. A large, four-digit display shows the user the operating pressure, even through oily glass. The equipment is parameterized with two push buttons that are easily operated with gloves. A recessed push button needs to be pushed to confirm the changes with the parameterization; mistakes can be avoided with this safety feature. Optionally, the PS300 family can be operated according to the VDMA specification 24574-1.

IO-Link in the future

Until 15 years ago, mainly contact switches were used for monitoring pressure. These were reliable, but only to a certain extent. Higher requirements of the applications – like easily switching the units or versatile reprogramming the switch points – made the electronic push button necessary. Today we face a change again, because better access to the instruments is needed. A simple binary or an analog signal is not sufficient any longer.

Quick read

To measure hydraulic pressure doesn't seem to be a big challenge at first glance, but it is not easy to find the right pressure sensor for this application in the right range. Not every sensor can cope with the special requirements of the hydraulic industry..

The solution for all this is called IO-Link. With this technology, the users have a standardized tool for the world of sensor technology and actuating elements. The technology offers new possibilities to make machines and systems even more efficient. The IO-Link is integrated into the pressure sensor family PS300. The investment into PS300 sensors is safe, even if the user wants to switch to the IO-Link at a future date and not at the moment.

If you talk about investment protection, you also have to talk about reliability and quality. A low price is tempting, but if there is a quality problem with the equipment it gets more expensive in the end, i.e. when there is a shutdown of a machine because of a low-quality sensor. To guarantee availability, many users have their important components in stock.

During the development of the PS300 family, Turck focused on quality and longevity of the product, as well as on the cutback of storage costs. As a press key with two switch points or as a measuring tool with an analog output, the PS300 family offers a device type for all applications and a reduction in storage costs. And with the IO-Link, the sensors adept very quickly to different situations. ■

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Employees, knowledge and machinery allow the production of electronics at the highest level in Beierfeld

Information www.turck-duotec.com

Electronics from the Erz Mountains

Turck duotec uses existing production and development capacities to transform customer demands into electronic solutions that are ready to go into mass production

The success story of Turck in the newly-formed German states started on February 16, 1990, when Werner and Hans Turck were looking for new co-operation partners. "After the fall of the Wall the capacities at our main location for production in Halver were nearly exhausted because of our constant growth," Werner Turck, founder of the company, remembers. "We found a promising partner with a former instrument factory in Beierfeld. The factory was the only one that produced inductive and optical sensors in the former German Democratic Republic". Eberhard Grünert, who was the deputy production director in 1990 and who is the director of Turck Beierfeld GmbH and Turck duotec GmbH today, saw a great chance in the cooperation with Turck. "Since the 1970s, we developed and produced electronic solutions and because of the cooperation we had the chance to continue this tradition," says Grünert.

Very quickly, the new partners started corporate activities, like the tradeshow in Leipzig, to advertise the products of Turck in the east of Germany. On July 6, 1990, Turck Beierfeld GmbH was founded with five employees.

Focus to the East

At the location in Beierfeld, there were two tasks to fulfill in the beginning: On the one hand, the development- and production areas of Halver and Beierfeld had to adjust. Standardized, administrative and constructive standards and tools were needed. On the other hand, a distribution network for the newly-formed German states had to be established. "We had to built a network of new business relationships fast and intensify those relationships with modern solutions," Grünert explains. In the time that followed, the market activities also expanded to Eastern Europe and Turck sub companies in Poland, Czechoslovakia, Russia, Romania, Hungary and other countries were founded.

For the development and production area, Turck could resort to the qualified workers from Beierfeld and use the already existing machines and the property of the former measuring instrument factory that were constantly modernized and expanded in the following years. "During the last 20 years we continuously invested in our members of staff, the machines and the real estate, so that today the company is able

In the last 20 years, Turck continuously expanded the location in Beierfeld

The employees develop and produce not only "yellow" Turck-products, but...

... also customized electronic solutions for innumerable fields of applications

to guarantee the production of electronics at the highest technical stage and employs more than 300 people," Werner Turck says.

While the company focused on the development and the production of Turck sensors in the beginning, the range of products expanded because of the more efficient production process and increased knowledge. Therefore, today the location in Beierfeld isn't just producing the typical products from Turck – it is also able to stand out as an innovative EMS-service provider by producing and developing customized electronics with duotec, a sub company of Turck. duotec uses the pre-existing development capacities and manufacturing technologies to offer a wide range of electronic solutions for innumerable fields of applications.

In 1987, Werner Turck founded Turck duotec in Halver: "To deepen our in-house production depth and to improve our quality and the packing density for our own and customized solutions, we especially gave attention to placement of technology with the thick-film hybrid and the CoB-technology", Turck says. "From these manufacturing techniques, the customers from duotec did benefit as much as the customers from Turck". Shortly after the founding of Turck in Beierfeld, duotec was founded there by Turck as well. "In 1991 we had our first project in Beierfeld with an automobile supplier. We optimized and produced electronic devices for them," Grünert explains. "Today we can offer customized and the most profitable electronic solutions. By doing so we also support the trend of electronic components regarding miniaturization and the proceeding complexity of integrated circuitry and functions."

Over the years, both German development and production locations developed a main focus: In Halver, typical Turck products are mostly produced, while in Beierfeld the focal point is on duotec. About three-quarters of the activities at the Erz Mountains are related to customized electronic solutions. Turck duotec delivers electronics for the fields of automotive engineering, railroad engineering and railed vehicles, medical technology, building services engineering, safety engineering, locking systems, electric drive technology, measurement technology and more.

Due to its substantial manufacturing technology, Turck duotec is the ideal partner for complex and challenging customer requests. „Our skills lie not only in the production area, but also in the optimized production of electronic solutions and logistics," Grünert says. „It is not only about delivering electronics, but also to check, label and document them so that they can be traced back at any time. That includes the integration into the supply-chain-management of the customer. On request, duotec sends electronic components directly in the transport boxes of the customers after their own logistic specification." One of the focal points of duotec is the subject of packaging: the efficient protection of the electronics from environmental conditions. Therefore, the company handles different technologies like sealing, foaming, varnishing and even direct insert molding of the electronics.

Customer day on the 17th of June

On the 17th of June, a customer day will take place at duotec in Beierfeld, where customers and interested parties can get an insight into current topics of customized electronic solutions. Experts will answer questions on various topics, like the market for prefabricated parts, ways to reach zero-error production, chip on board technology, LED technology and thick-film hybrid technology, among others. Interested parties can register online for free at www.turck-duotec.com. ■

"During the last 20 years we continuously invested in our members of staff, the machines and the real estate."

Werner Turck, Turck duotec

"Our skills lie not only in the production area, but also in the optimized production of electronic solutions and logistics."

Eberhard Grünert, Turck duotec

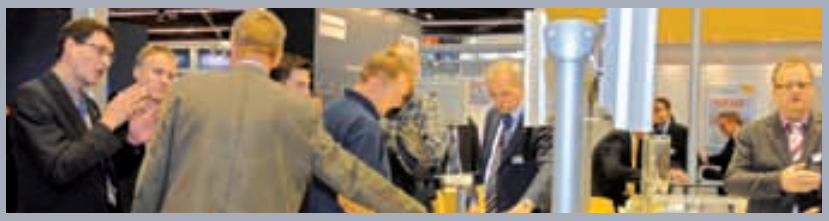
Quick read

Turck celebrates two successful decades of existence of its second development and production location at Beierfeld in Saxony in the newly-formed German states in the summer. The former measuring instrument factory turned into an innovative location, which is one of the supporting pillars of the Turck company group today and which employs more than 300 people.

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.

Dates	Trade Show	City, Country
19.04. - 23.04.2010	Hannover Messe	Hanover, Germany
11.05. - 15.05.2010	Technical Fair	Belgrade, Serbia
25.05. - 28.05.2010	MSV	Nitra, Slovakia
25.05. - 28.05.2010	Kofas	Chungwon, South Korea
31.05. - 03.06.2010	Eliaden	Lillestrøm, Norway
02.06. - 04.06.2010	IAC, TME + Sensor	Shanghai, China
08.06. - 10.06.2010	Rax	Tel Aviv, Israel
13.09. - 17.09.2010	MSV	Brno, Czech Republic
22.06. - 25.06.2010	Expo Pack	Mexico City, Mexico
28.09. - 30.09.2010	Assembly Technology Expo	Rosemount, USA
19.10. - 21.10.2010	ISA	Houston, USA
12.10. - 15.10.2010	Vienna-Tec	Vienna, Austria
13.10. - 16.10.2010	EloSys	Trencín, Slovakia
31.10. - 03.11.2010	Pack Expo	Chicago, USA
02.11. - 04.11.2010	Metalform	Atlanta, USA
23.11. - 25.11.2010	SPS/IPC/Drives	Nuremberg, Germany



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Turck on the Internet

Whether sensor, fieldbus, interface or connection technology, in the product database on www.turck.com you will find the right solution to your needs at the touch of a button. Three search functions will help you.

Turck on Site

With 27 subsidiaries and numerous branch offices, Turck is always nearby, anywhere in the world. This guarantees fast contact to your Turck partners and direct support on site.

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Printing
Medienhaus Ortmeier, Saerbeck, Germany

▶ Webcode **more11080e**


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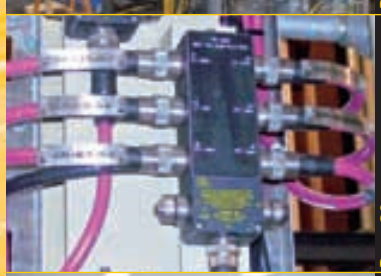
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