

»Project Future«



Back to the Future is the title of this issue of your more@TURCK customer magazine. In this issue's cover story starting on page 8, we present one of our new products for the fair, an ultracompact I/O module with protection to IP67, enabling you to make devices with serial interfaces fit for the requirements of Industry 4.0.

The issue of digital transformation runs like a red line right through this issue of the magazine. This applies both to the new products we are presenting at the SPS IPC Drives fair, as well as to the company itself. We have grown organically for over 50 years, and for the first time in our company history we have taken over the majority interest of a company: Our former RFID turnkey solution partner Vilant Systems is now part of the Turck Group. The RFID professionals will continue to operate independently on the market as Turck Vilant Systems but will use the global sales

and service structure of the group. Turck customers worldwide will thus benefit in future from the software and application know-how of the Finns, which has allowed them to become one of the most successful suppliers of turnkey RFID solutions on the market. More information on our new family member is provided on page 36.

Back to the future also applies to me personally. At the end of February 2018, I will withdraw from the management board and take up a new stage in my life. Even though I will naturally continue to be closely connected to the company, I am looking forward to having more time for my private life, particularly for my children and grandchildren. I know that our family-owned company will also be in very good hands in future, and am sure that we can continue to write our success stories for you and with you. Thanks to your support, we have already had some outstanding success this year, as we are expecting it to be the most successful business year in the company's history.

We will be pleased if the articles in this issue of more@TURCK give you one or two ideas, or if you wish to speak with our specialists about your specific requirements for efficient automation. Please do visit us at fair stand 250 in Hall 7 or contact your Turck sales specialists.

Yours sincerely,

Ulrich Turck, Managing Director

Content

NEWS

INNOVATIONS for Automation Specialists 04

COVERSTORY

FIELDBUS TECHNOLOGY: Back to the Future 08

Turck's TBEN-S-2COM I/O module for serial communication simplifies the connection of RS232, RS485 and Modbus-RTU devices to Ethernet networks; the module is also able to handle Big Data applications

INSIDE

INTERVIEW: »The Trend is Towards the Single Cable Solution« 12

In this interview with Doris Beck, Editor of technical journal Hanser Konstruktion, Dr. Michael Berginski, Director Product Management Connectivity, talks about Turck's large connectivity portfolio and the custom connector solutions from the company's in-house production.

COMPANY: Stronger Together

36

Turck is acquiring the majority interest in RFID turnkey solution supplier Vilant Systems and is expanding its portfolio for the RFID sector with software, systems and services

TECHNOLOGY

FIELDBUS TECHNOLOGY: Cross Border Traffic

14

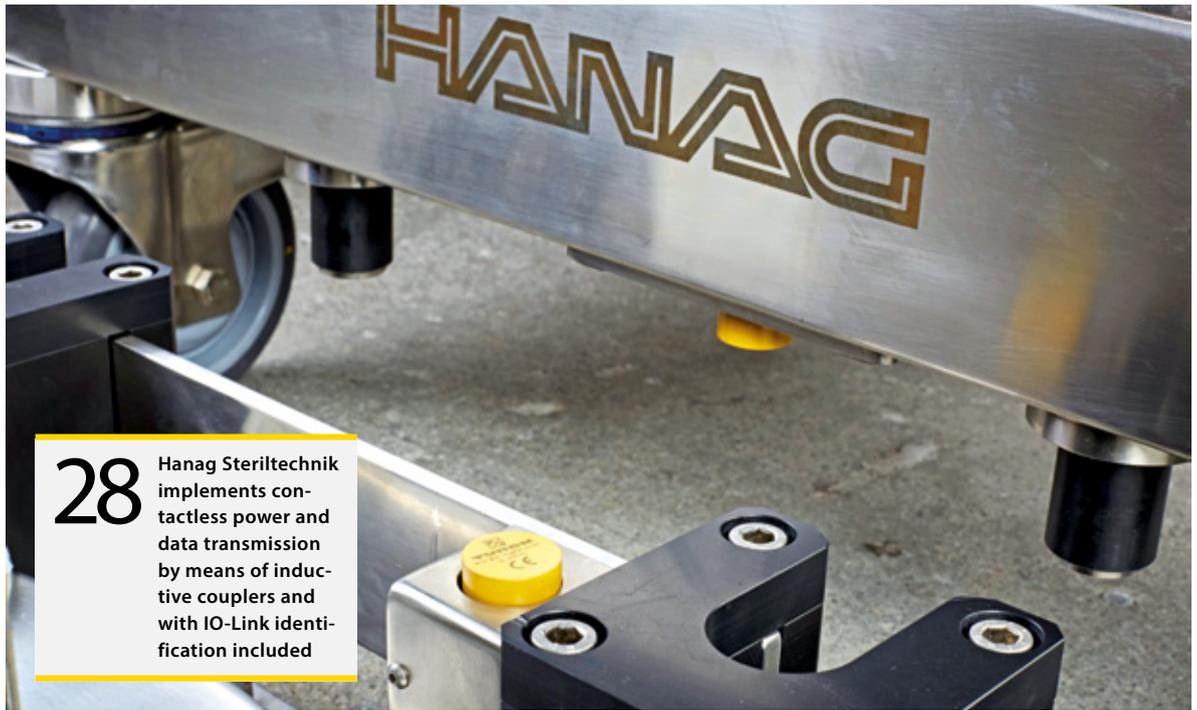
A new I/O block module with protection to IP67 is enabling data exchange for the first time between two Ethernet networks directly in the field without the need for a control cabinet

TREND

IO-LINK: Planning with Foresight

20

IO-Link overall concepts enable users to save costs already today – and use tomorrow intelligent sensor data for Industry 4.0



28 Hanag Steriltechnik implements contactless power and data transmission by means of inductive couplers and with IO-Link identification included



24 Turck encoders and RFID systems ensure safe movement for the fair-ground rides of Hessen-based amusement park supplier Wiegand

APPLICATIONS

RFID/SENSOR TECHNOLOGY: Ready for Takeoff 24
Amusement park supplier Wiegand is implementing the future position measurement in two fairground rides with a system consisting of encoders and RFID read/write heads from Turck, connected to a Hima safety controller

SENSOR TECHNOLOGY/CONNECTIVITY: Convenient Coupling 28
In the sterilization machines of the Swiss company Hanag Steriltechnik AG, Turck's inductive couplers transfer power and switching signals contactlessly – the ID of the IO-Link sensor is also used for the reliable identification of each container

FIELDBUS TECHNOLOGY: Compact Protection 32
Packaging manufacturer DS Smith monitors its paper presses at its Erlensee plant with an intelligent I/O solution from Turck

SERVICE

CONTACT: Your fast Route to Turck, Imprint 38



36 With the takeover of Vilant Systems, Turck can expand its portfolio for RFID projects

Most Successful Year in the Company's History



Turck is forecasting a sales increase of around 15 percent for business year 2017. The consolidated group turnover at year end is expected to exceed the 600 million euro mark. "For Turck, 2017 will be the most successful business year in the company's history," said Turck managing director Christian Wolf in the annual press conference at corporate headquarters in Mülheim an der Ruhr. The number of employees at all Turck sites has risen from 4200 to 4500. At the four German sites in Mülheim an der Ruhr, Halver, Beierfeld and Detmold, Turck has around 2050 employees. "In virtually every region, we are expecting two-digit growth," Wolf continued. "An essential share of this success has come this year from our US subsidiary, which, from already high sales figures achieved growth of 22 percent to approx. 275 million US dollars. We will also achieve a similar result in Southeast Asia and Australia. China is a particular highlight, as we can report record growth here of currently 33 percent." With the 2020 corporate strategy, Turck is focussing on regional proximity and worldwide solutions expertise. With the takeover of former Canadian agency Chartwell completed in October, Wolf can now welcome another 100-percent owned subsidiary to the Turck Group. With the takeover of its Finnish RFID turnkey solution partner Vilant Systems, Turck is expecting to strengthen its solutions expertise in the software, system and service business, which is of great strategic importance with regard to Industry 4.0. Effective January 2018, the company will be named Turck Vilant Systems. For 2018 Wolf announced several major investment projects including those at the production facilities in Mexico and China. In Eastern Europe, Turck intends to establish a new production plant for connectivity solutions.

more info
on page 8

Robust IP67 I/O Module for Serial Interfaces



Turck is adding a variant for serial interfaces to its range of TBEN-S ultracompact module series. The TBEN-S-2COM connects devices with an RS232 or RS485 interface directly in the field to controllers with the Profinet, Ethernet/IP or Profinet protocols. This saves users from having to run long wiring routes to the control cabinet. The user can choose between RS232 and RS485, as required for the characteristics of the two serial ports. The module also offers four I/Os that can be used as inputs or outputs without any configuration. Use in very demanding environments is possible thanks to the high degree of protection to IP65, IP67 to IP69K, as well as the extended temperature range from -40 to +70 °C. A client function for Modbus RTU comes already integrated in the I/O module.

Multi-colored RGB Indicator Lights with IO-Link

Turck introduces the Banner K30L2 and K50L2 indicator lights. Turck's partner Banner Engineering designed and manufactured the LED lights for use in any application requiring high-visibility status indication. K30L2 and K50L2 indicators utilize RGB LED technology to support seven colors in a single indicator using just three inputs. This versatility makes it possible to standardize on a single model of indicator, reducing replacement stock requirements and simplifying ordering. K50L2 indicators are also available in models with IO-Link communication, which enables full control of color, flashing, dimming, and advanced animations like rotation, strobing, 2-color display, rotation, flashing, and chase.



Turck Takes Over RFID Partner Vilant Systems

Turck has acquired the majority of the shares of its current RFID turnkey solution partner Vilant Systems based in Finland. The company is now part of the Turck Group. After completion of the transition process in January 2018, the new company name will be Turck Vilant Systems. With this transaction Turck is strengthening its commitment to software, systems and services, which is of high strategic importance in terms of Industry 4.0 and the Internet of Things. "Our customers require not only excellent hardware products, but more and more complete system solutions including software, integration and maintenance services, especially in the RFID business", says Christian Wolf, Managing Director of Turck. "With the experienced specialists from Vilant, we are now able to meet these requirements better and support our customers on the way to Industry 4.0." Founding partners Ville Kauppinen and Antti Virkkunen (hence Vil-Ant) remain shareholders and managing directors of the new Turck Vilant Systems. More info on page 40



Turck Chartwell is now Turck Canada Inc.



Turck has acquired the remaining 50% interest in Turck Chartwell Canada Inc. and thus is 100% owner of the new subsidiary. Effective January 2018, the new company name will be Turck Canada Inc. Turck initially acquired the first 50% interest in 2014. Mark and Steve Boehmer, the two founders of Chartwell, have signed long-term management contracts. They will continue to lead the company as President and V.P. Sales and Marketing.

Spanner Connects Production Lines



Turck's TBEN-LG-EN1 spanner is a block I/O module that enables communication between two different Ethernet networks directly in the field. The robust module with protection to IP65/IP67/IP69K features a glass fiber reinforced housing and fully potted module electronics. The TBEN-LG-EN1 is the first spanner module that can be used directly in the field. This benefits the user by eliminating the need for cables to the control cabinets and ensuring a straightforward installation. The bidirectional data exchange from master to master guarantees simple communication with controllers. More on page 14

Linear Position Sensor for Mobile Hydraulics



Turck is adding the robust LTE sensor for direct integration in hydraulic cylinders to its portfolio of linear position sensors. The magnetostrictive sensor can withstand shocks of up to 100 g and the vibrations that typically occur with agricultural and forestry machinery. The device is also insensitive to external influences, so that the LTE is even suitable for use in the hydraulic cylinders of construction machinery in extremely severe environments.

Change in Company Management



Ulrich Turck will withdraw as Managing Director of Hans Turck GmbH & Co. KG on reaching the age of 67 on March 1, 2018. At the same time, Christian Pauli (l.), so far Executive Vice President Finance, will be appointed as Managing Director by the advisory board of Turck Holding GmbH, alongside Christian Wolf (r.). Together with Guido Frohnhaus, Managing Director of Werner Turck GmbH & Co. KG, Wolf and Pauli will also constitute the management board of Turck Holding. In accordance with the succession plan, responsibilities in the Turck Holding will be distributed among the three Managing Directors: Frohnhaus is responsible for the areas of manufacturing and development, Wolf is responsible for sales and marketing, and Pauli for finances, human resources and IT.

New Managing Director in Sweden



Since September 1, 2017, José Ramalho is the new Managing Director of the Turck subsidiary in Sweden. Ramalho has 20 years experience in the automation industry, most recently as a sales manager in the field of process automation. In addition, he was responsible for the system and project management team of his former employer.

RFID Modules Enhanced with FLC Functionality



Turck has expanded the functionality of the TBEN-S-RFID compact Ethernet/RFID interfaces. The block I/O modules with protection to IP67 come with a new free of charge firmware update, offering many new functions, including the license-free ARGEE programming environment. This Field Logic Controller function (FLC) enables users to implement low to medium complexity control tasks directly on the block I/O module so that these tasks can be decentralized. This reduces the load on the central controller so that only the relevant data has to be transferred. The TBEN-S-RFID can be linked easily to PLC systems without the use of a special function block being necessary.

Illuminated Touch Buttons in a Flat Design

Turck is expanding its pick-to-light portfolio with the K50 Flat illuminated touch button from Banner Engineering, its optical sensor partners. Due to its low height of 17 mm, the robust IP69K button is ideal for use in restricted mounting conditions. Slight touch contact with the finger or palm with no physical pressure is enough to cause triggering. It is actuated just as well with gloves as with bare hands. The K50 Flat has similar functionality as the K50 dome indicators. It is used as a touch button, request button or in pick-to-light applications. The K50 Flat is available with one to three colors and is also highly visible in bright environments. The button is designed with IP67/IP69K protection and is immune to false triggering through dirt, water droplets, oil or cleaning agents.





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Back to the Future

Turck's TBEN-S-2COM I/O module for serial communication simplifies the connection of RS232, RS485 and Modbus-RTU devices to Ethernet networks; the module is also able to handle Big Data applications

While serial interfaces have largely been replaced in the IT world by Ethernet and USB, they still have a good standing in industrial automation sector. Not only well-established devices are provided with onboard interfaces. There are many new products, from barcode scanners and light screens to printers, weighing scales and operator terminals, as well as many drives, that use these interfaces for communication. This is another reason why Turck has developed its IP67 Ethernet I/O module for connecting serial interfaces. Besides the two ports for RS232 or RS485, the TBEN-S2-2COM-4DXP provides four digital inputs or outputs. The characteristics of the serial ports (RS232, RS485 or Modbus RTU) can be selected as required. The I/Os can be used here as inputs or outputs without any configuration required.

QUICK READ

Serial interfaces still play an important role in many areas of industrial automation. This is why Turck has added the TBEN-S-2COM block I/O module to its TBEN-S portfolio and is thus consistently pursuing its "moving out of the cabinet" strategy. The IP67 module offers two serial interfaces and four I/O channels. It communicates with the controller via Turck's multiprotocol technology with Profinet, Ethernet/IP or Modbus TCP. This makes the module equally suitable for both general use in new installations and for retrofit projects. For anyone wishing to prepare for the future, the 2COM module brings serial interfaces into the era of Industry 4.0: The parallel communication via Profinet (to the controller) and Modbus TCP to Edge gateways or data hubs enables the intelligent evaluation of device data for predictive maintenance.

Wiring in the field saves time and money

The new TBEN-S modules simplify the connection of devices to a serial interface. Depending on the selected connection technology, the modules achieve IP65/67 protection or even IP69K, and can therefore be used directly in the field at the machine. This shortens the wiring runs from the module to the devices in the field. Only one Ethernet cable and one power supply are run from the I/O module to the control cabinet. Both cables, power and Ethernet, can be looped through from module to module in a daisy chain, and in the ideal case, just have to be run once from the control cabinet to the field. The TBEN-S-2COM supplies smaller devices such as barcode scanners with power via the bus connector – thus also reducing here the time and costs required for wiring.





Whether for serial interfaces, Ethernet multiprotocol technology or predictive maintenance – Turck's 2COM module is a universal tool for automation

Configuring instead of programming – Modbus RTU

Besides the savings possible in wiring, users of the module benefit from the fact that the programming required for communication with Modbus RTU devices is kept to a minimum. Modbus accesses normally have to be programmed and processed separately in the controller environment. Turck's serial module comes with Modbus RTU already integrated. The user just has to configure addresses and process data areas. The module then takes over the processing of the protocol and exchanges process data with the controller. Complicated function blocks for Modbus are not required.

The module is thus the perfect counterpart for several Modbus RTU devices, such as smart sensors or also the light curtains of Turck's optical sensor partner,

Banner Engineering. For example, up to 64 pick-to-light sensors of Banner's K50 series can be run on just one I/O module. Pick-to-light applications couldn't be cheaper to set up. The 2COM module is also the ideal link to integrate existing Modbus RTU nodes in modern Industrial Ethernet networks.

Motor control with predictive maintenance

Motors with serial interfaces are often used in the materials handling, logistics and packaging technology sectors. A good example of this are the Movimot motors of SEW Eurodrive. In RS485 operation, up to 32 motors per COM port can be connected to the TBEN-S2-2COM. Banner's QM42VT2 also provides a sensor for monitoring vibration and temperature that can likewise be connected with the module via RS485. When

Up to 32 motors per COM port can be connected via RS485 to the TBEN-S2-2COM. The sensor for vibration and temperature can likewise be connected with the module via RS485. This enables bearing damage to be diagnosed early on, so that maintenance operations can be planned



mounted directly on the drive, it enables bearing damage to be diagnosed early on, so that maintenance operations can be planned. This is a simple and efficient way of implementing predictive maintenance.

Additional PLC communication also in parallel

Another feature of the TBEN-S-2COM opens up opportunities for Industry 4.0. Like all devices of the TBEN series, the TBEN-S2-2COM also supports Turck’s Ethernet multiprotocol technology, which enables the devices to be used in Profinet, EtherNet/IP and Modbus TCP networks. It is even possible to access the device via Modbus even in parallel with the existing controller connections. For motor control with predictive maintenance, for example, the data of the vibration sensor can be sent directly to higher-level systems, such as Edge

gateways, data hubs or cloud systems for further analysis. Many commonly available systems, such as Microsoft Azure, IBM Bluemix, as well as OPC UA servers from Matricon and Kepware, support communication via Modbus TCP.

ARGEE makes the module into a field logic controller

Like all the latest TBEN modules, the 2COM module also features the browser-based ARGEE programming environment for serial interfaces. ARGEE enables PLC functions to be programmed directly on the modules of the TBEN-L, TBEN-S, BL compact and FEN20 block I/O series. These types of field logic controllers (FLCs) enable elementary controller functions to be outsourced to the I/O modules, thus relieving the workload on the central PLC and the bus communication. The ARGEE programming environment is a simple web application. It simply requires a PC with a web browser such as Chrome or Firefox. Simple requirements can also be implemented on the Turck block I/O modules completely autonomously with ARGEE.

Programming couldn’t be easier. In Simple mode, which is like a ladder diagram editor, drop-down fields provide the means by which inputs and outputs can be linked with Boolean operators and actions. This makes it therefore possible to program basic functions without any knowledge of a programming language. Professional mode makes the entire range of functions available, which can also be used, for example, to implement sequential function charts.

SPECIFICATIONS

- Ultracompact dimensions (W x L x H) 32 x 144 x 32 mm
- Two COM ports, configurable as RS232 or RS485
- Data rates from 9.6 Kbit/s to 230.4 Kbit/s
- 192 bytes of input and output data for each port
- Integrated Modbus RTU client function
- Four universal digital inputs or outputs
- Ethernet multiprotocol (Profinet IO, Ethernet/IP, Modbus TCP)
- Ethernet switch with two M8 ports
- Ethernet media redundancy (MRP, DLR)
- M8 power supply with two galvanically isolated groups
- Protection type: IP65/IP67/IP69K
- Extended temperature range from -40 to 70 °C

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»Flexible, field-wireable connectors are preferred in Europe. This requires the availability of well-trained specialists.«

»The Trend is Towards the Single Cable Solution«

Dr. Michael Berginski | Director Product Management Connectivity

In this interview with Doris Beck, editor of technical journal Hanser Konstruktion, Dr. Michael Berginski, Director Product Management Connectivity, talks about Turck's large connectivity portfolio and the custom connector solutions from the company's in-house production

Turck has long been recognized as a well-established manufacturer of connectors in the USA. Why have you been mainly represented in Germany up to now in the area of sensor, fieldbus and RFID solutions?

There is a great demand for special customized connectivity solutions in the US market. In Germany and Europe, on the other hand, connectivity tends to be more of a commodity business with catalog goods, replaceable components with pricing kept to a minimum. We have therefore primarily had connectors in Europe developed and produced via a partner company.

Why are you intending to expand your European market at this particular time?

We have been doing this for around five years. We have extensive development and production know-how in the USA, where we have been producing connectors

for 30 years. We intend to also use this know-how over here.

How important are the connectors for the overall business?

Today, they represent a two-digit share of total sales in Europe. We see ourselves as system suppliers and aim to offer the customer complete solutions. These mostly also involve connectors, which are therefore very important to us.

What are the differences between the plug connector requirements of the US and European markets?

There are some differences. The most apparent difference is the fact that customers in the USA are more easily attracted to large and robust plug connectors that are easy to grip. For production and purchasing, however, the difference in cable qualities is more significant. While halogen-free

cables are important for the European market, US customers place more importance on non-flammable components. Cables typically used in the USA have approvals for completely different standards are not comparable with European cables.

Are they also differently designed?

Those in the USA are already far more advanced and offer a great degree of modularity. They primarily achieve this through the use of overmolded plug connectors. In Europe, on the other hand, permanent wiring is used more often or field-wireable plug connectors. Although this is more flexible, it also requires the use of well-trained specialists.

Do you think that this trend will also establish itself in Europe?

Yes. In future, suppliers will have to cater for stand-alone modules which just have to be fitted together with individual connectors. In Europe there is still a preference for the use of flexible fixed wiring in situ or field-wireable plug connectors. Companies are then also willing to connect three, four, or five connectors; not a problem if you have electricians who can just do the wiring quickly. In other places, however,



untrained workers are required to commission assemblies, ideally in one single operation. This therefore requires the power and the data to be contained in a single connector. That is why I think that the trend is moving towards the single cable solution.

However, some people consider this type of solution to be more prone to faults...

Although shielding will become an issue, if the coding is correctly configured, the system shouldn't be more error-prone. I can also envisage the use of factory-assembled hybrid connectors. Through quality controls in production these can reduce many risks to the users.

What are the sectors in which customized plug connectors are of particular interest?

Not every individual safety solution has the same amount of requirements. These range from unusual cable lengths right through to new plug faces with proprietary designs. More complex solutions are only worthwhile if the production volumes are large enough. They will therefore be of particular interest for series machine and plant builders in a wide variety of sectors, such as in the field of mobile equipment, in the automotive sector or device manufacturers. Our connectivity solutions are particularly successful when we develop a complete solution together with the customer. In this case, our connectivity products are often part of a larger package.

What changes will the Industrial Internet of Things bring to plug connectors?

We expect the number of bus cables to increase and we also expect more hybrid connectors, i.e. single cable solutions on the market. IO-Link will generate a counter trend. This is designed to save cabling costs. IO-Link can do the same job with fewer and more simply designed plug connectors and connection cables, as the signals are transferred digitally and do not require shielding. In my view, this development supports the trend towards a smaller number of standard types for the majority of applications.

Author | Doris Beck, Editor of the technical journal Hanser Konstruktion, conducted this interview

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Cross Border Traffic

A new I/O block module with protection to IP67 is enabling data exchange for the first time between two Ethernet networks directly in the field without the need for a control cabinet

Compared to point-to-point wiring, this saves the user considerable costs for the connection technology and the wiring. There is also a time saving benefit when the machine is set up at the customer. Instead of running several individual cables to the control cabinet, it is normally only necessary with fieldbus or Ethernet systems to run one communication cable and power supply in order to connect the I/O level to the controller. The wiring of the periphery to the remote I/O technology can then be done in advance at the machine builder and thus consistently reflects the procedures of modular machine building. Besides the I/O technology, Turck's TBEN-L-PLC also offers control technology in IP67.

Turck has been offering robust RFID interfaces with IP67 protection for a long time. The decentralized architecture has the best results if it can be implemented end-to-end, i.e. if the use of a separate control cabinet is ideally no longer necessary. The TBEN-L

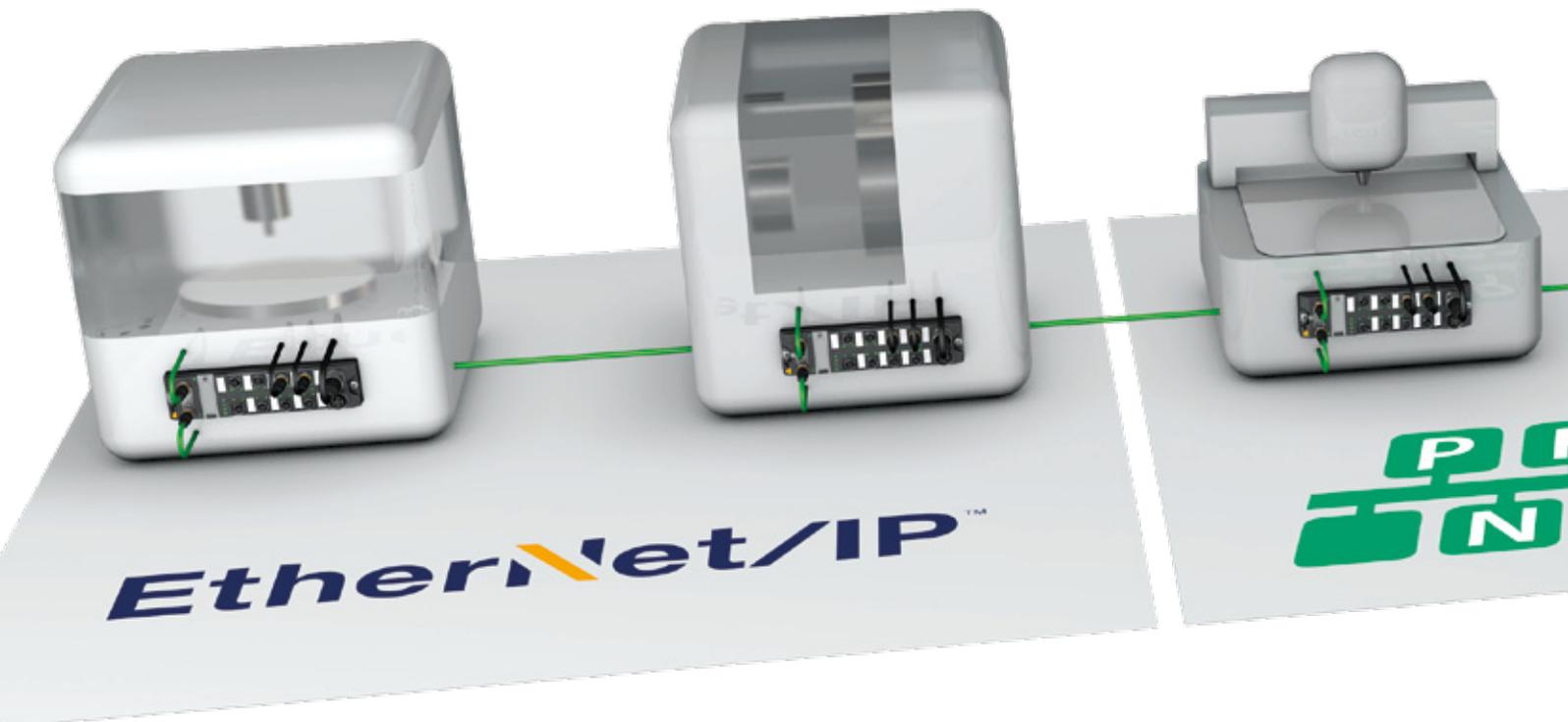
spanner is another product on the journey towards this objective. In its function as a slave for both sides, it offers bidirectional data exchange from master to master.

The production chains of factory automation are usually made up of the plant sections of different manufacturers. Major customers can often demand the installation of a specific controller. However, whilst smaller companies are supplied with the plant sections they require, these are often equipped with controllers of different manufacturers. Even very large automobile manufacturers may implement production lines consisting of machines from different controller manufacturers due to their international structure and production strategy.

Data transfer between "foreign" machines

Up to now, the data transfer between the machinery in this type of line has often been implemented with an

The TBEN-L spanner module with IP67 protection combines modular production chains with different Ethernet protocols without the need for control cabinets and extensive wiring



I/O coupling and restricted to a few bits. Interfaces for this could be set up easily. However, the move towards smart and predictive production chains has required the machinery and therefore the controllers to exchange more information between each other than simply "product ready to transfer" or "transfer station ready to receive" messages. Operators often use an identification system for the data transfer that is based on barcodes or RFID. However, for many product types this is too expensive and simply not possible.

Conventional Ethernet gateways with IP20 protection are used when the two machines to be connected use controllers with the same Ethernet protocol. These have to be wired into the control cabinet and therefore require long cabling runs.

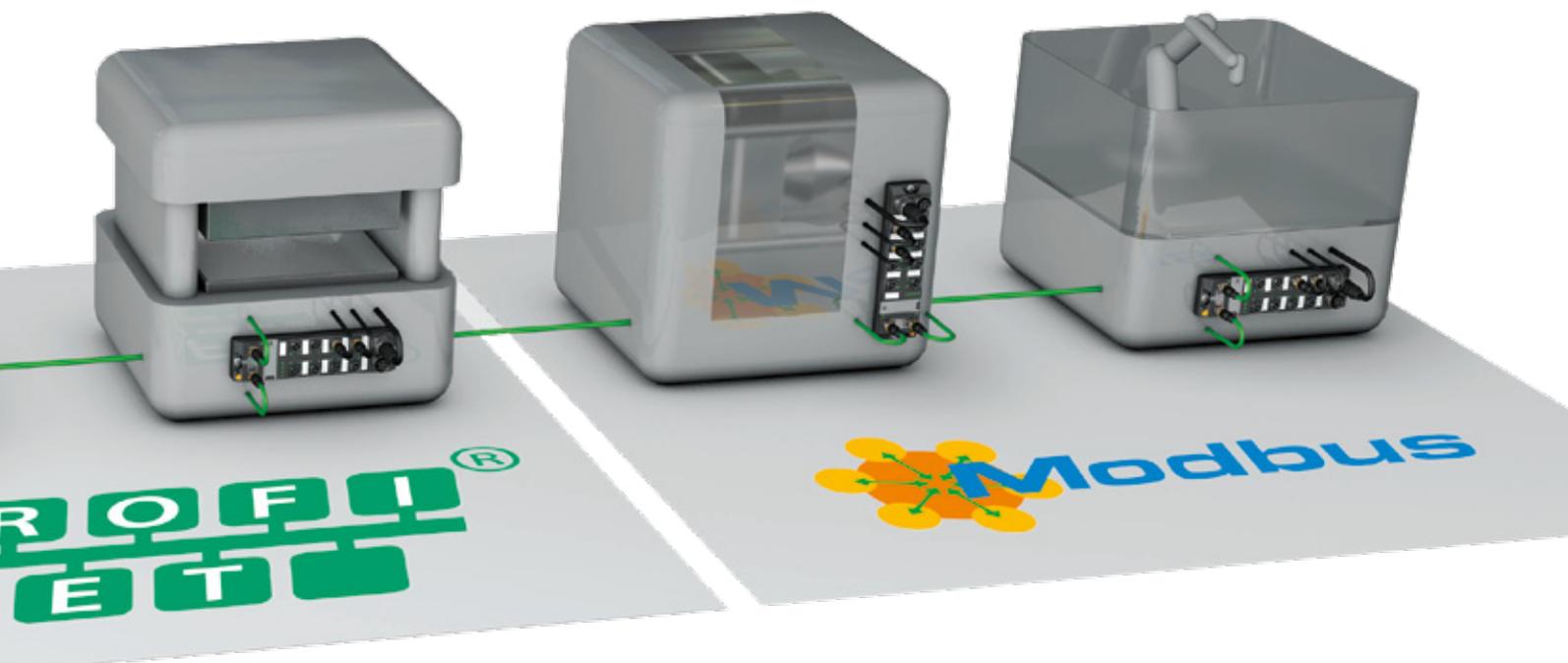
First spanner for the field

Turck is consistently taking the decentralization further away from the control cabinet into the field. The

QUICK READ

Turck's TBEN-L spanner provides another answer to the requirements of Industry 4.0. The robust IP67 block I/O module exchanges data between two networks directly in the field. The device replaces the last I/O module of a machine and functions as a first slave for the next controller in a production line. Compared to conventional IP20 Ethernet gateway solutions, this reduces costs and wiring effort. With its first IP67 spanner module, Turck is taking one more step out of the control cabinet into the field and is enabling data transmission for intelligent production processes, even beyond the limits of individual Ethernet networks.

automation specialist has developed the first block I/O module with degree of protection IP67, which enables communication between two networks directly in the field. The TBEN-L spanner exchanges data bidirectionally from master to master. Unlike the existing products on the market, the Turck spanner does not require a control cabinet, thanks to its high degree of protection (up to IP69K). Data exchange is thus carried out where the action takes place: directly in the field where the machines are connected. The spanner acts as a slave for both controllers and thus enables direct master-master communication. The data moves with the





Industry 4.0 tools: Turck's I/O module series FEN20, TBEN-S and TBEN-L are not only suitable for multiprotocol operation, but can also be used as intelligent FLCs

Field Logic Controller

With the field logic controllers (FLC) Turck offers another highly flexible, user-friendly automation solution. This is made possible by the browser-based programming environment ARGEE. It is based on HTML5 and JavaScript and allows the user to program conditions and actions in a very simple way, even in the field with mobile devices. By using ARGEE Turck's multiprotocol block I/Os can be used as independent logic controllers. ARGEE will not replace any PLC completely, but the engineering software enables new ways of control technology. Turck FLC devices can independently control applications, perform arithmetic, timer, counter and binary switch functions and exchange data with higher-level controllers.

An FLC with ARGEE FLOW can

- be configured with boolean logic
- logically link input and output signals
- use up to two timers and counters
- communicate with a PLC

An FLC with ARGEE PRO can

- perform arithmetic operations
- use numerous internal variables, timers and counters up to 6 kB total size
- exchange comprehensive data with a PLC
- perform if-conditions and state sequences

product via the spanner from one machine to the next. This enables the signal and data flow to be branched in the production lines – fully in line with the principles of Industry 4.0.

Versatile multiprotocol module

Thanks to its multiprotocol technology, the TBEN-L spanner can process the data of Ethernet protocols such as Profinet, EtherNet/IP or Modbus TCP. For example, it can connect a Profinet master with an EtherNet/IP master or an EtherNet/IP controller with a Modbus TCP controller. The data interface acts as a postbox for both masters, in which both controllers can put and get data. The spanner also features 16 digital inputs. It therefore has a dual function. The Turck spanner can replace an I/O module which the machine builder would have had to use anyway. Compared to an external Ethernet spanner in the control cabinet, this solution is more cost effective, since the spanner simply replaces the standard I/O module that is required anyway.

1:1 NAT router

The different machine builders do not have to take into account the IP address of the other production lines for the data transfer to be successful. The NAT router function (Network Address Translation) of the TBEN-L spanner makes the coordination of IP address spaces between manufacturers unnecessary. It is often the case that machine builders use their usual IP addresses. This means that it is very possible for two manufacturers to use the same IP address. If these networks were connected, major problems would occur, since two identical IP addresses cannot be connected in the same network.



»With our growing portfolio of robust and intelligent IP67 solutions, we are supporting the trend towards modular production chains and pave the way for our customers to Industry 4.0«

However, the TBEN-L spanner works as a NAT router, which converts the IP addresses. The spanner handles the IP addresses of the manufacturers as unique addresses and thus prevents a double assignment in the network, irrespective of the actual settings made by the manufacturers. In this way, the spanner guarantees a unique possibility of integration for plant manufacturers, as they no longer have to make arrangements between themselves in order to prevent a double assignment.

Large portfolio of decentralized solutions – IP67 controllers included

Besides the TBEN-L spanner, Turck offers a large portfolio of decentralized solutions. Turck's FLC (Field Logic Controller) technology brings the logic to the

field level. The ARGEE web-based programming environment adds logic functionality to Turck's block I/O modules. ARGEE enables PLC functions to be programmed directly on the modules of the TBEN-L, TBEN-S and FEN20 block I/O series. In this way, simple controller functions can be outsourced to the I/O modules, thus relieving the workload on the central PLC and the bus communication.

The ARGEE programming environment is a simple web application. It simply requires a PC with a web browser such as Chrome or Firefox. Thanks to Turck's multiprotocol Ethernet, modules pre-programmed in this way can be used in Profinet, Ethernet/IP or Modbus TCP networks. Simple requirements can also be implemented on the Turck block I/O modules completely autonomously with ARGEE. The additional



The TBEN-L5-EN1 spanner module functions as a slave for both controllers and thus enables direct master-master communication. Thanks to its multiprotocol technology, it works in Profinet, EtherNet/IP and Modbus TCP networks



The browser-based ARGEE programming environment can also be operated with mobile devices

controller intelligence provided by ARGEE makes Turck's block I/O modules ideally equipped to meet the requirements of Industry 4.0 scenarios: They support the key Industry 4.0 technologies of Ethernet and IO-Link. RFID Ethernet interfaces with ARGEE onboard are now in the Turck program.

Genuine IP67 PLC

As well as the programming environment for low to medium complexity applications, Turck also offers a full featured PLC with IP67 protection. The TBEN-L-PLC Codesys-3 controller is a compact IP67 controller for use directly in the field. When used as a master, the device also supports Modbus RTU, in addition to CANopen and SAE J1939, as well as the industrial Ethernet protocols Profinet, EtherNet/IP and Modbus TCP. The TBEN-L-PLC can also be run as a slave (e.g. device) in the CANopen and Modbus RTU networks as well as in the three supported industrial Ethernet networks, thus enabling it to be used as a protocol converter. For example, the controller can operate as the CANopen manager of a machine module networked with CANopen and connect this module to a

system running with Profinet. With the increasing digitization of industrial production processes, the PLC enables existing machine concepts to be made fit for the challenges of closely networked, highly flexible production.

Onward to Industry 4.0

With its portfolio of decentralized solutions, Turck is showing how existing machinery and plants can benefit from increased efficiency and increased transparency resulting from the evolution of Industry 4.0. They open up possibilities for retrofitting plants or show new ways for the modular design and electrical planning of machines and production lines.

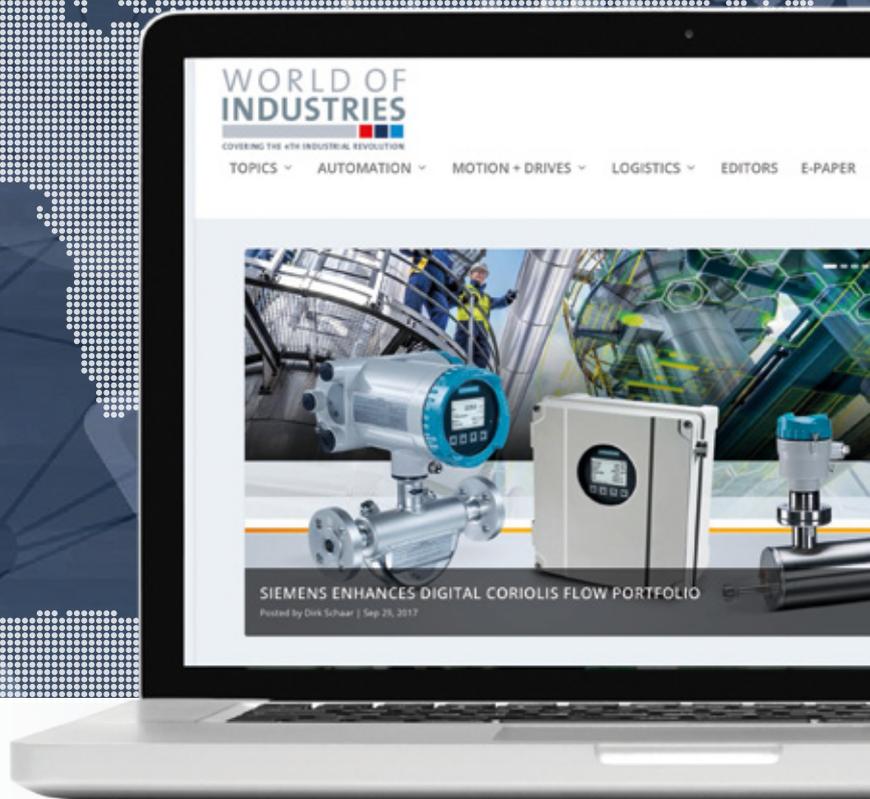
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Turck supports its customers on the way to Industry 4.0 with an extensive IO-Link portfolio

Planning with Foresight

IO-Link overall concepts enable users to save costs already today – and use tomorrow intelligent sensor data for Industry 4.0

IO-Link has rapidly penetrated the market over the past years. Whilst the number of IO-Link nodes was 2.19 million in 2014, it had already increased to 5.3 million by 2016. Exponential growth is also expected for the coming years. As a digital communication standard, IO-Link is designed as the integral component for the last meter of the smart factory. However, this is precisely the problem. Many users associate the technology exclusively with future applications that they have not yet defined. Sometimes they even assume that the transition would also require basic proximity switches to be replaced with expensive variants. However the opposite is the case. Furthermore, not every switch in an IO-Link system has to have an IO-Link interface. In several applications, IO-Link firstly reduces costs. The customer therefore benefits immediately. At the same time, it establishes the basis for new applications that will arise through Industry 4.0.

Digital instead of analog

Hardly one sector sticks so closely to analog signal transmission as the automation sector. Digital information here requires considerably less bandwidth than analog. At the same time, digital transmission is more robust. IO-Link offers a bidirectional point-to-point connection with up to 230.4 kBaud, ensuring very reliable communication via unshielded standard cables.

IO-Link sensors are often cheaper than their analog counterparts, as they do not require a D/A converter. This firstly enables the user to make savings in wiring and secondly in terms of the device itself. Another benefit is the fact that the IO-Link master channels are downward compatible with conventional binary sensors with one or two switching outputs. Compared to analog inputs, spare channels can mostly still be used.

Turck supports IO-Link from the start and today offers one of the most extensive IO-Link portfolios. This ranges from multiple sensors to connection technology, right through to fieldbus and Ethernet I/O systems with IO-Link masters with degree of protection to IP20 and IP67.

From the passive junction to Ethernet and IO-Link

In most applications, binary I/O signals, such as from inductive proximity switches, represent the most frequently used signal type. Even today, these are frequently collected in the field by passive junctions (IP67) and routed via multipole cables in control cabinets to central or decentralized I/O modules (IP20). In order to save costs for devices and wiring, more modern concepts use active decentralized IP67 I/O modules in the field. These can collect the signals as closely as possible to the action and transfer them

»The decision to use IO-Link systems prepares users already today for Industry 4.0 scenarios and also reduces costs.«

directly to higher-level controllers via Industrial Ethernet (or other fieldbuses). This eliminates the need for decentralized modules in the control cabinet, which itself can be designed with smaller dimensions. An additional benefit is the cheaper wiring via Industrial Ethernet. This architecture with IP67 I/O modules, which collect signals directly in the field, plays an important role in automation, particularly if only a few signals are collected in situ, for example on robots.

IO-Link can also reduce the costs in applications with a high I/O density. So-called I/O hubs enable up to 16 additional signals to be compressed and transferred via IO-Link. IO-Link masters with four or eight ports collect this data over distances of up to 20 meters and transfer it to the controller in bundles via an Ethernet cable. In this variant users make savings three times over: Compared to industrial Ethernet modules, I/O hubs are cheaper; instead of shielded Ethernet cables, unshielded standard cables are used; and as IO-Link requires only one cable for data and power, separate power supply cables become unnecessary. A further benefit is the fact that IP addresses are only required for each IO-Link master and not for every I/O module. Turck's TBIL I/O hubs (IP67) for IO-Link transfer up to 16 I/O signals via M12 round connectors with metal threads.

With actuators to the IO-Link overall system

It was thought for a long time that any smart actuators or sensors would be based in future on Industrial Ethernet. However, current engineering practice shows the limits of Ethernet in automation. Ethernet, with a transfer rate of 100 Mbit/s or even 1 Gbit/s and a minimum frame size of 64 bytes, is simply over dimensioned for many devices. Ethernet interfaces are also comparatively expensive and produce a lot of heat. IO-Link can technically fill this gap with a very good cost-benefit ratio. Although IO-Link is often defined as a smart sensor interface, the technology was specified from the beginning for communication with sensors and actuators. This gives it a critical advantage over Ethernet, since power and communication are transferred in a single cable.

One of the best known examples of field devices with an IO-Link interface are valve blocks. All major manufacturers now have IO-Link valves and valve

blocks in their portfolio. Complex connections using adapters with Sub-D multipole connectors can be replaced by inexpensive standard cables. Gripper systems, motors, first frequency inverters and IO hubs with digital outputs are other examples of actuator modules using IO-Link. Turck's TBEN-L-8IOL IO-Link masters were specially optimized for actuator operation. Unlike other manufacturers they provide up to 4 amperes at two ports.

Users particularly benefit from the possibilities that IO-Link offers, such as with signal indicators with several segments. The connection of light indicators with more than two segments using digital multipole cables was already very complicated. However, IO-Link lights with configurable colors for each segment, audible signals and several additional functions can be wired and operated easily via a standard cable. The TL50 indicators from Turck's optical sensor partner Banner Engineering are available with IO-Link. The configuration and number of indicator elements is therefore no longer limited by the wiring effort involved. Users therefore more often decide to use more than two signal elements. This makes it possible to show other machine states than just "OK" and "Error".

Integration in higher-level systems

Different options are available for the configuration and integration in higher-level systems. Devices can firstly be assigned via IO-Link masters or USB masters or USB adapters with the help of configuration tools. Alternatively, the configuration can be carried out with

QUICK READ

IO-Link is playing a major role in the development of smart factories and smart data. The communication standard offers digitalization right down to the sensor level. The growth figures of recent years impressively demonstrate its popularity. Nevertheless, many users associate the transition with higher costs. This is the case even though IO-Link allows expenditure for hardware and installation to be significantly reduced, particularly when it is used as an overall system.



Stack lights with an IO-Link connection, such as TL50 from Banner Engineering, ensure fast and simple connection and parameter setting, even with more than three elements

IO-LINK FREES UP DEVELOPMENT RESOURCES

A key benefit of IO-Link is its independence from any fieldbus protocols. The number of relevant fieldbuses and industrial Ethernet protocols presents manufacturers of decentralized field devices with a real challenge. Developing device variants for each protocol, maintaining them over the entire life cycle and providing also the necessary support involves considerable costs. This also ties down personnel resources, which are blocked from deployment in future developments and innovations. Some manufacturers have therefore already committed themselves exclusively to the IO-Link interface and are going without the integration of bus interfaces. They are leaving the integration in higher-level systems up to the manufacturers of the IO-Link masters. In this respect, IO-Link is thus also an innovation motor since it frees up development resources.

function blocks in the controller. This makes it possible, for example, to change the configuration of a device during operation as part of a profile change. The properties of higher-level networks such as Profinet or EtherNet/IP means that there are still no manufacturer-independent options for configuring IO-Link devices directly from the engineering system. However, an improvement of the situation is in sight. In June 2017, the "IO-Link Integration – Edition 2 for Profinet IO" specification defined the interfaces for manufacturer independent engineering for Profinet.

The IO-Link masters of the TBEN-L and TBEN-S series, with the simple IO-Link device integration function (SIDI), already offer today the possibility of integrating Turck and Banner devices by plug and play. All the company's IO-Link devices are integrated in the station GSDML files of the IO-Link masters of the TBEN series. This considerably simplifies the setup. When the GSDML file is read in by an engineering software (TIA Portal or other), all Turck devices can be selected as a specific port configuration. Any additional parameterization or programming is no longer necessary.

Cost benefit of the overall system

If the change to IO-Link is made dependent on an individual component, IO-Link masters can be seen to

be a disadvantage due to the overhead costs for IO-Link masters. However, if the system is considered in its entirety and a change of sensors and actuators and I/O systems assessed as well, considerable costs can be saved with IO-Link. The cost saving benefits of IO-Link do not become fully apparent until the time required for wiring and cable assembly are taken into account.

The many Industry 4.0 scenarios, which frequently involve connection with the intelligent interface, are unnecessary. However, the IO-Link system makes users already well prepared for these scenarios. The more flexible setting of sensors from the controller or the querying of sensor data for predictive maintenance can be set up at a later time. Not only IO-Link devices – the capabilities of the master are also critical for using the system intelligently at a later time. However, the devices of the manufacturers also vary here, although the communication standard is the same. The Turck IO-Link masters installed in multiprotocol I/O modules can thus also be accessed with Modbus TCP in parallel with Profinet. This enables the transfer of data to higher-level I4.0 or IIoT systems such as SAP PCo, Microsoft Azure or IBM Bluemix.

Outlook

The IO-Link product landscape already offers all components today for the economical implementation of complete solutions for automation. The latest activities of the IO-Link community show how IO-Link also equips customers for the future. The IO-Link Safety Specification makes it possible to also implement safety concepts in future for all aspects of IO-Link. The IO-Link community also has specifications under way that enable standard access to IO-Link masters and devices from higher-level I4.0 systems.

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The TBEN-IO-Link master with "Simple IO-Link Device Integration" (SIDI) already enables today the integration of Turck and Banner devices with plug and play

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Ready for Takeoff

Amusement park supplier Wiegand is implementing the future position measurement in two fairground rides with a system consisting of encoders and RFID read/write heads from Turck, connected to a Hima safety controller





The new solution from Turck and Hima impressed Workshop Manager Oliver Grothkopp



The fairground business, with its dedication to the amusement of other people, sounds like a very fulfilling profession. This was also what Josef Wiegand thought when he opened his first ski lift in 1963. For many years he followed the motto "Ski and toboggan well", before expanding his portfolio due to the fall in sales resulting from the lack of winter weather. Since that time the Hessen-based company, Josef Wiegand GmbH & Co. KG, patented summer toboggan runs and thus grew to be world market leader in this sector.

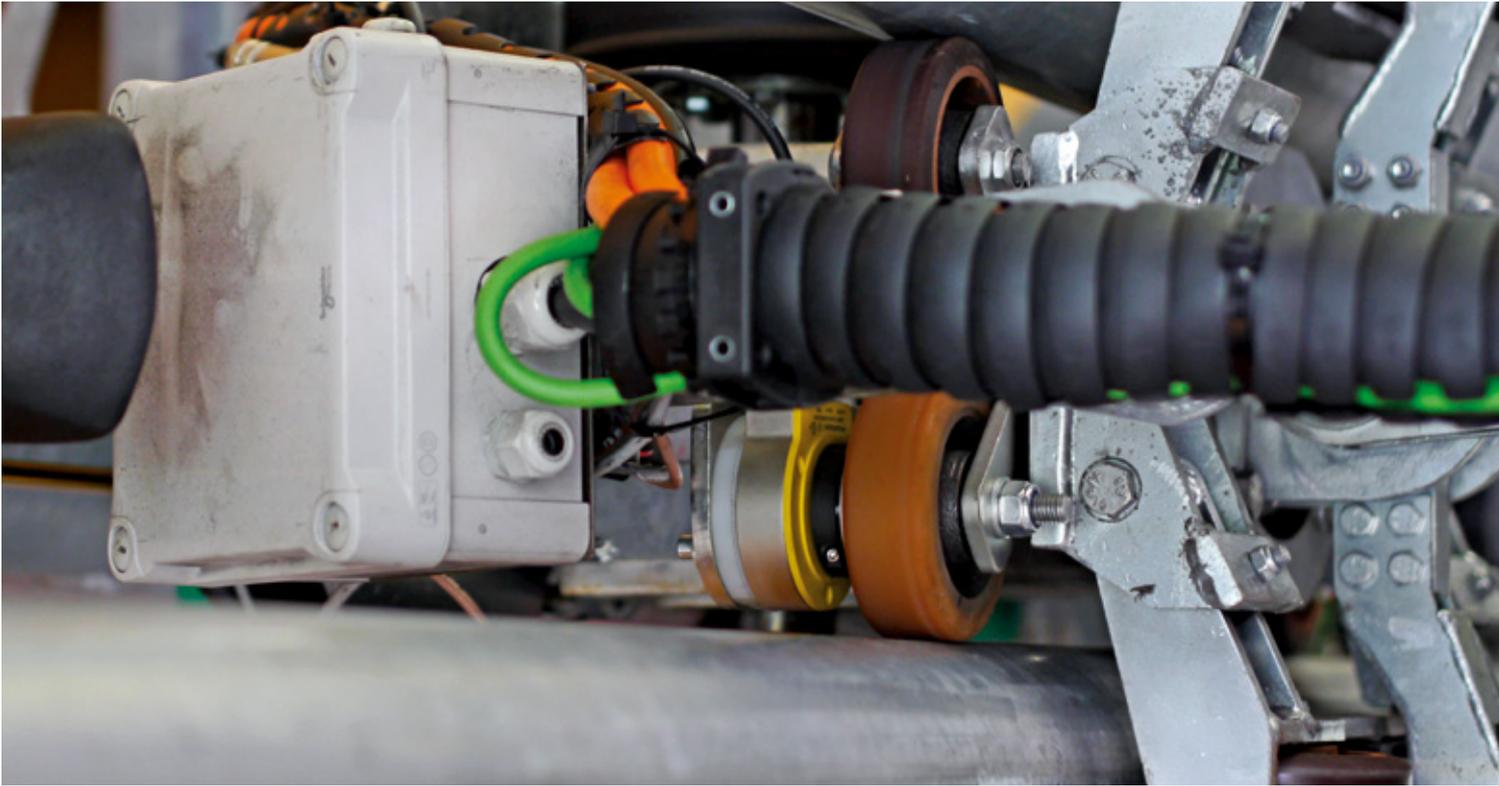
Whilst the portfolio of the company, headquartered in Rasdorf, initially consisted of standard summer toboggan runs, its current portfolio includes flying rides, water slides, Bobkarts and other types of toboggan runs. What was formerly a one-man company has now grown into a medium-sized family business with ten branches and 450 employees worldwide. Beside the planning and production of the amusement rides, Wiegand also handles the installation of its products worldwide. The water slides, for example, can even be found on large cruise liners such as the AIDA. If a fault occurs during a Mediterranean cruise, Wiegand fitters carry out the repair directly in situ. Wiegand has now introduced a few technical innovations to its flying rides, the so-called Wie-Flyers, and on its Bobkarts.

One controller, different options

The Wie-Flyer is a suspended gondola-shaped two-seater, in which the riders can control its speed as

QUICK READ

Wiegand, the Hessen-based amusement park supplier, previously used an encoder in its Wie-Flyers and Bobkart circuits that only offered limited performance in severe outdoor environments. After this was discontinued, Wiegand and its integrator ARI-contact came upon a permanently robust solution based on Hima and Turck products. Turck encoders, RFID tags and read/write heads will in future ensure safe movement for these fairground rides. Through the combination of incremental and RFID position sensing, the system reliably prevents any collisions. The controller of cooperation partner Hima was adapted here especially to the modules used.



Turck's QR24-INCR encoder is positioned on the roller of the rail guide, from where it sends pulses to the controller

required. They “fly” at speeds of up to 40 km/h through the bends of the suspended rail system as on a big dipper. The power for the flyers is supplied via a system integrated in the rails. An automatic distance control system is integrated in order to prevent collisions. This measures the position of the individual gondolas and lets them communicate between each other. In this way, the following gondola always knows the location the gondola in front. The gondolas are offered, in two different versions – either an open gondola, the so-called twin-seater or twin-flyer, in which the riders sit side-by-side, or a closed gondola, where the seats are arranged one behind the other.

The Bobkarts are electrically driven toboggans that run through a stainless steel track. They are supplied with energy via a touch proof conductor rail, which is run in a channel connected to the track. As with the

Wie-Flyer, customers also control the speed of the Bobkart toboggan themselves. As the Bobkarts have the same controller as the Flyers, the same speed and rear-end collision prevention features are used.

However, the special feature of the Bobkarts is the fact that they don't need a hill. If the customer is only on a level section, the track functions just as well as on a slope. This was also the thinking behind the development of the Bobkarts, as they solve the problems of many amusement parks located on level ground. They can thus also be used in restricted spaces. The possibility to run the track in loops enables space saving and versatile designs.

In the previous design, Wiegand used optical encoders in its Wie-Flyers and Bobkarts in combination with a Hima safety controller. When the manufacturer discontinued the encoder, Wiegand looked for a suitable replacement for the positioning of its amusement rides. Added to this was the fact that the previous solution was very susceptible to faults and mechanical problems often occurred. “We were often called out to our customers to carry out repairs, even as far as China,” workshop manager Oliver Grothkopp recalled.

Hima and Turck offer the solution

Wiegand, Hima and its integrator ARI-contact then started to search for an alternative solution. The controller manufacturer found the solution at Turck. Hima knew the requirements that the position sensing and safety system had to fulfill due to the previous collaboration. The system had to determine the position of the individual gondolas and control or restrict their speed on the basis of this information. Fail-safe position sensing also had to be guaranteed



The Wie-Flyer track in Brotterode is equipped with RFID tags

»Hima found the Turck encoder to be a reliable solution.«

Andreas Meyne | Hima



The HIMatrix in the control cabinet coordinates the other controllers in the rides

even at high speeds. Besides position sensing via an encoder, RFID was also used.

“Hima found the Turck encoder to be a reliable solution,” confirmed Andreas Meyne, project manager responsible at the controller manufacturer. The non-contact design of the QR24 encoder makes it particularly suitable for operation in harsh environments, since its operation is not impaired by vibration, humidity or contamination. The inductive measuring principle enables the design of positioning element and sensing unit to be combined in a fully enclosed and encapsulated unit.

Intensive development process

The position sensing solution using RFID and encoder enables the controller on board the gondola or kart to coordinate the position sensing. Turck developed a firmware specifically for its RFID read/write heads. Hima provided a function block for this that was specifically designed for Turck’s RFID system. “This enables us to achieve a guaranteed read speed,” said André Aßmus from system integrator ARI-contact.

The QR24-INCR incremental encoder transfers pulses to the controller, which calculates from this the actual speed of a gondola. The encoder is located on a guide roller in the upper section of the Flyer. If there is a deviation, or if the preceding Flyer is too close, the controller of the following vehicle initiates the rear-end collision prevention measures. Programmed tolerance values prevent any unnecessary intervention.

Controller: HIMatrix F35 034

The HIMatrix F35 034 controller used is an SIL3-certified safety controller with shortened reaction times consid-

erably below ten milliseconds. This makes it ideal for use in this project, which requires fast communication and reaction times. The controller is also compact and shock-proof, which enables use in any vehicle. The HIMatrix is also used centrally at Wiegand. As a controller is provided in every ride, a controller in the control cabinet takes over the higher-level network controller function.

Worldwide use

The Bobkart runs and other amusement rides from Wiegand are used worldwide. The Wie-Flyers have so far only been used on the testing grounds of the company in Brotterode, Germany. However another track has already been sold as a Twin-Flyer in Mexico City. They will be used here as an attraction in a shopping center. The Bobkart runs are already in operation at 20 sites, including in China, Japan, Kuwait, and Saudi Arabia, and also in German amusement parks, such as the Ravensburger Spieleland.

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Convenient Coupling

In the sterilization machines of the Swiss company Hanag Steriltechnik AG, Turck's inductive couplers transfer power and switching signals contactlessly – the ID of the IO-Link sensor is also used for the reliable identification of each container



When pharmaceutical manufacturers fill their solutions for intravenous infusions, the last production stage involves the sterilization of the ampoules, caps and stoppers. This is often performed with the machines of Hanag Steriltechnik AG, a company based in Switzerland. The company has its headquarters in Oberwil and is one of the most important Swiss suppliers in the field of plant and vessel construction. It has gained an excellent reputation internationally, thanks to its

QUICK READ

The product portfolio of Swiss company Hanag Steriltechnik AG includes machinery for the treatment of caps and stoppers for the pharmaceutical industry. These are sterilized using different processes, which require the reliable identification of each container in the process. Where plug contacts were previously used for a long time, the company today uses a solution with contactless data and power transmission. This involves the use of an inductive coupler with the "application specific tag" of the IO-Link sensor to identify each container and ensure the correct position of the containers in transport trolleys at the transfer stations.

stopper and cap processing machines. The company primarily focuses its activities in the field of sterilization applications. A brief look at Hanag's list of references reads like a who's who of European pharmaceutical manufacturers.

Sterilization process

The cap and stopper treatment process consists of the steps washing, sterilization, drying and cooling. The packaging material is filled in containers, which then run through the different process stations. The containers can be moved and turned in their trolley. The pharmaceutical manufacturer runs different programs for the different types of stoppers and caps. The customer therefore wanted the ability to identify containers at the individual stations. Hanag had previously solved this with a plug-in contact. This integrated a binary coding via which each container could be identified uniquely.

Eric Netzhammer, CEO of Hanag Steriltechnik AG, and his team wanted a contactless connection of the containers at the transfer stations. This saves the customer from having to connect the plugs. Together with the automation consultants from Turck's Swiss sales partners Bachofen, Netzhammer and his team compared different inductive systems for contactless signal and power transmission. "The Turck coupler system was identified to be the most suitable solution for us," Netzhammer says. "The temperature rise in particular is less than with similar products. Turck's NIC coupler is also provided with an IO-Link interface."

Identification via IO-Link

The IO-Link standard provides for a free text field, the "application specific tag" (AST), for each IO-Link device. This can also be used to identify individual devices. The customer can thus identify containers at the particular stations, without having to use an additional RFID system. In all three lifting stations, the controller queries via the AST whether the correct packaging material is loaded. The customer's S7200 controller does not enable the process until the content of the container corresponds with the formulation to be run.

»The Turck coupler system was identified to be the most suitable solution for us. The temperature rise in particular is less than with similar products. Turck's NIC coupler is also provided with an IO-Link interface.«

Eric Netzhammer | Hanag Steriltechnik AG



The BI6U-M12-IOL6X2 IO-Link sensor detects the correct position of the rotation unit via the switch lug

IO-Link switch prevents operating errors

When the containers are transferred, the trolley is docked with two guides at the lifting column. This ensures the correct positions of the trolley and the inductive coupler. As the container in the trolley can be rotated, however, it must be ensured that it is located in the correct position for lifting or reuse after the process. For this Hanag installed a switch lug that dampens Turck's inductive IO-Link sensor when the correct position is reached and thus triggers a signal.

After the container is identified, a check is also made whether the rotation unit of the trolley is correctly aligned for lifting the container or returning to the trolley. "With one customer, the lifting arm was even bent because the operator had not ensured the correct position. This happened even though this was a circuit that made the presence of the operator obligatory," Netzhammer reports. In other cases, it was possible for the container to tilt in the trolley if the rotation position was not correctly aligned. Today, the controller doesn't enable the lifting arm until this position is also correct.

Increased process safety

The safety of the process was further increased by the checking of the rotation position, and the identification task was implemented more simply with the contactless coupler. The fact that a simple switch can today also be used for identification tasks is one IO-Link capability that was not even considered when the smart sensor/actuator interface was developed. Today, Hanag no longer has to implement a separate identification solution via plug contacts or RFID.

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Customer | www.hanag-steriltechnik.ch

Sales Partner | www.bachofen.ch

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The stopper and cap processing machines of Swiss-based Hanag Steriltechnik AG are in demand worldwide

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The "Balemaster" at the Erlensee plant of DS Smith shreds paper and compresses it into two meter cubes

QUICK READ

DS Smith is one of the leading manufacturers of customized packaging and displays using corrugated board as a base material. The company has up to now been monitoring manually the output of its paper presses in the Erlensee plant near Hanau. A complete solution now automatically provides employees with information from laser sensors and an intelligent I/O module about when the bales from the two paper presses have reached the maximum limit and have to be moved away. This saves a lot of time since employees no longer have to continually check progress in the neighboring hall. Turck's TBEN-S compact I/O module with the ARGEE integrated field logic controller operates here as a stand-alone controller – directly in the field, without the need for a control cabinet.





»A control cabinet or housing are not required for the TBEN-S module – for me a major benefit.«

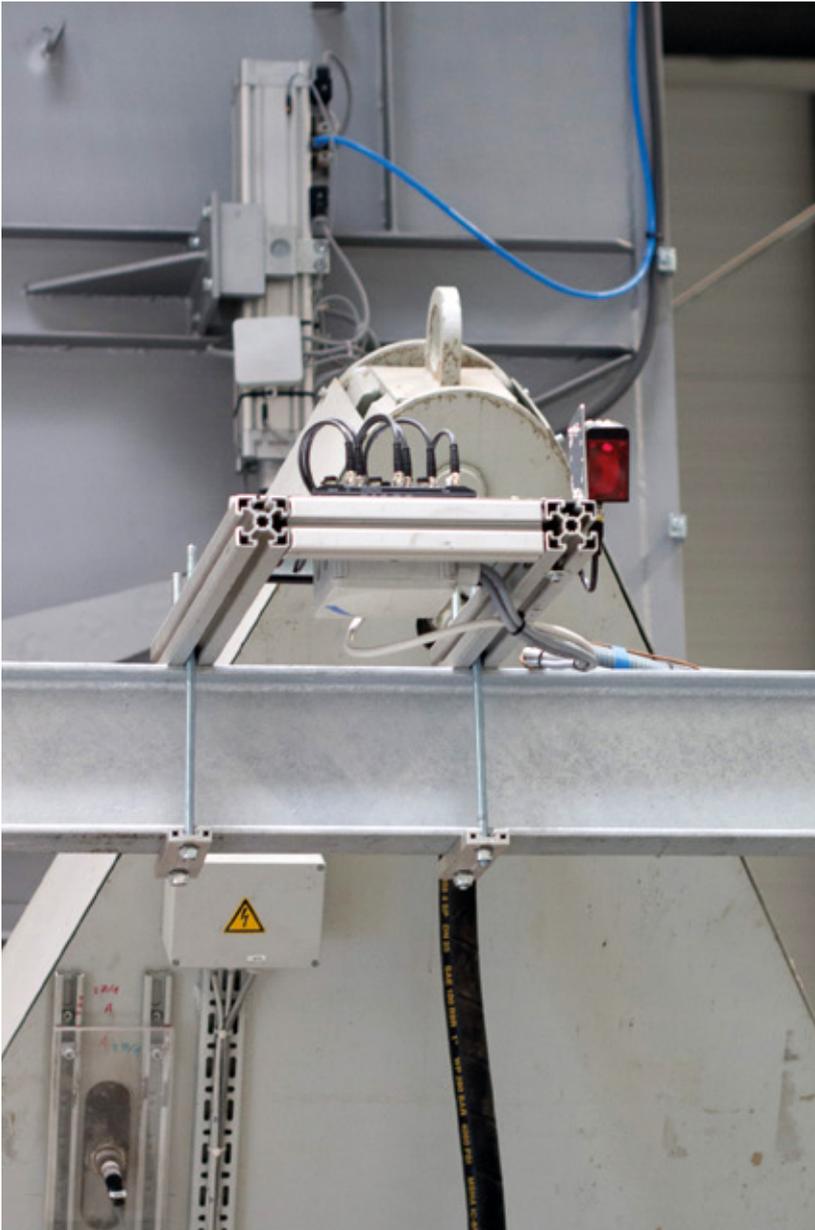
Manfred Ernst | Sonepar

Compact Protection

Packaging manufacturer DS Smith monitors its paper presses at its Erlensee plant with an intelligent I/O solution from Turck

DS Smith moved from its Hanau site to Erlensee in November, 2016, and the machines have been running here since then. The company is one of the leading manufacturers of customized packaging and displays in Europe. DS Smith always takes the complete supply cycle of its customers into consideration, so that its processes can be optimized. The creative displays and the innovative packaging concepts help the customer to reduce corporate costs and to increase sales. The product portfolio includes shelf ready packaging suitable for commercial use, striking point of sale displays, consumer products – as well as transport packaging and packaging concepts for industry.

Sustainability is a very important issue for DS Smith. The company has its own recycling area. Reject material accumulated during production is further processed here for recycling. This is prepared for shipment and further processing directly in the factory. Offcuts and faulty packaging are shredded in a waste press, compressed into cubes and transferred into the storage room.



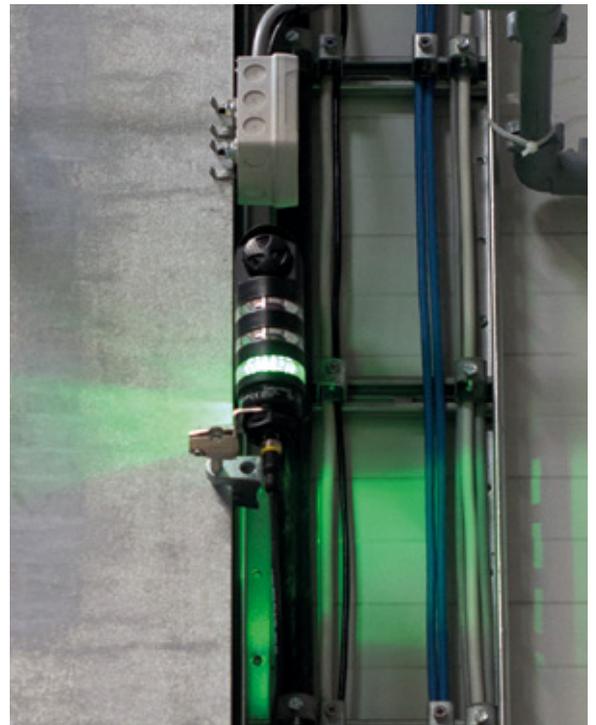
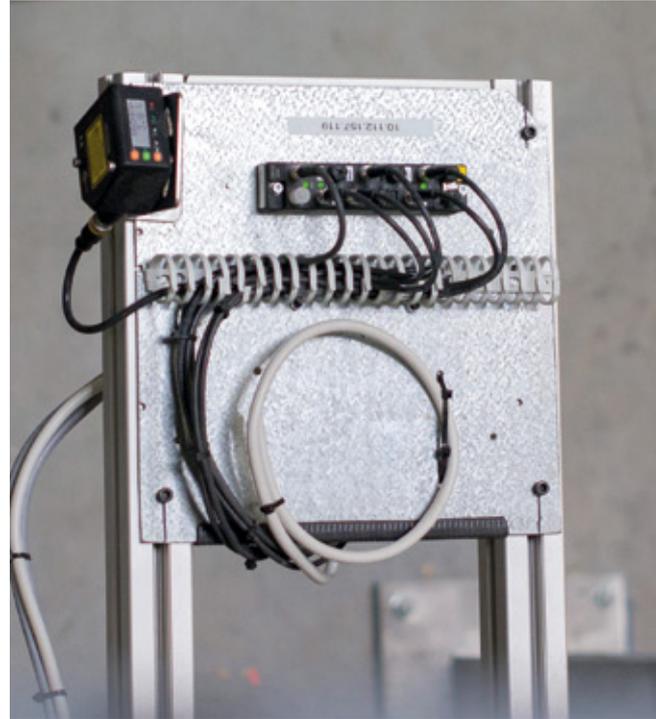
Banner's LTF12 laser sensor monitors the output of the paper bales and triggers a signal to the TBEN-S when the limit value is exceeded

At the Erlensee plant, this process functioned perfectly. The only thing missing was a feedback signal from the press. As this is located in a room where nobody is permanently at work, it was always necessary for an employee to stop working and check the progress of the machine. The colleague responsible could only estimate how many bales the machine produced in an hour on the basis of the material supplied. Coming too early meant a loss in working time. Coming too late meant that the clearing up with a fork lift was always more difficult. In the worst case, the bales could have pushed in on the thin wall to the adjoining hall and pushed through it.

Basic light sensor not enough

To prevent this, a system had to be used that would provide information on the progress of the bales. Philipp Freppon, employee responsible for maintenance at DS Smith, found that a standard light sensor was not enough for this task. In order to ensure a correct switchoff, a sensor was needed that not only

Decentralized intelligence: Turck's compact TBEN-S block I/O module with ARGEE controls the application directly in the field without the need for a control cabinet



The TL50C signal light indicates the status of the "Balemaster" to the employees in the adjoining hall – visually and acoustically

supplied switching information but also measured the distance, so that it would only switch within a specified switching distance window. However, passing colleagues and employees who are removing bales with a fork lift truck would also be detected by the sensor. Added to this is the fact that structural factors prevented the sensor from being mounted at the side since the wall required for this had a rolling door. Simple

light sensors, light switches or a photoelectric sensor were therefore unsuitable for the requirements at DS Smith.

Decentralized intelligence without a control cabinet

Freppon presented this problem to Manfred Ernst, specialist automation consultant at Sonepar, an electrical wholesaler. He recommended a measuring laser sensor, which, in combination with a compact controller, could evaluate the data and trigger an appropriate signal. Ernst had already got to know Turck's I/O modules with the ARGEE integrated programming environment and tested it at the customer's site.

In addition to eight universally configurable inputs and outputs, the TBEN-S module also makes it possible to link inputs and outputs with actions and conditions in order to run small applications autonomously. The ARGEE programming environment required comes already pre-installed as standard on every module, thus turning the I/O modules into intelligent field logic controllers (FLCs). The software is based on HTML5 and JavaScript, and enables the user to configure the module without any previous knowledge of a programming language. Programming is carried out easily via a standard web browser.

When the LTF12 laser sensor with the connected TBEN-S was tested in the Erlensee plant, Freppon was greatly impressed: "At first I thought I needed a control cabinet as well as the sensor. However, we then came upon the TBEN-S module with ARGEE. This fitted perfectly straightaway. It is compact, fits everywhere and offers very good protection to IP67, thus eliminating the need for a control cabinet." Manfred Ernst also appreciates the high degree of protection of the I/O module: "A control cabinet or housing are not required for the TBEN-S module – for me a major benefit."

Intuitive programming in an instant

Besides the ability to program links with Boolean operators, the modules can perform calculations, timer, counter and binary switch functions, as well as exchange data with higher-level controllers. The module itself is connected to a network via an Ethernet male connector, which in turn is connected to a desktop computer, from where programming can be carried out with a browser. All the required data is provided clearly on one page. "This has worked brilliantly. The programming is intuitive, and almost self-explanatory," Freppon describes his experience. "In order to program the system, an input and output are always used to implement these connections as well as to carry out the required action. Although all this is programmed with a browser, no permanent internet connection is needed." "Once stored, the program can be used at any time," says Freppon. The fact that no additional software has to be installed on the customer's computer is a particular benefit. ARGEE is a server-free web application that runs in the web browser.

The timer was programmed via ARGEE likewise as a condition. Freppon selected a factor here of 45 seconds. This time factor prevents error messages caused



by people in the light beam or passing fork lift trucks. TL50 LED traffic light outside of the hall indicates the status of the machine at any time. If the signal is triggered for 45 seconds, the green light switches to yellow and the siren is switched on. The red light, which is triggered by the controller of the "Balemaster", only lights up when there is a fault at the machine. This enables employees to carry out their work and only requires them to intervene when the signal is activated. These settings also offer additional safety.

The TL50-LED traffic light indicator with its integrated siren from Banner Engineering, Turck' optical sensor partners, enables the signal to be noticed in the adjoining hall. The integrated siren notifies employees when the maximum bale output has been reached, even if the light is not in view. "We liked this feature very much, as we really have everything rolled into one; a genuine all-round complete solution. Even the cables are from Turck." Freppon was able to combine the number and colors of the stack light elements at DS Smith as required. In this case, a conventional traffic light indicator with three light units for red, yellow, green and the siren element was chosen.

Reliable object detection

A key benefit of the LTF12 sensor is its ability to detect objects reliably. From a height of 0.5 to 12 meters, it can detect objects, regardless of material composition and color, even from narrow viewing angles or in bright ambient light of up to 40 000 lux. Users can thus install the sensor very flexibly. The LTF12 sensor used at DS Smith is located on the paper press and looks down from above onto a point five meters in front of the machine output.

Both Philipp Freppon (left) from DS Smith, and Manfred Ernst from Sonepar, are impressed by Turck's cabinet-free complete solution

Author | Christoph Lauer is Key Account Manager for the electrical wholesale business

Integrator | www.sonepar.com

Customer | www.dssmith.com

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Stronger Together

Turck is acquiring the majority interest in RFID turnkey solution supplier Vilant Systems and is expanding its portfolio for the RFID sector with software, systems and services

Antti Virkkunen (left) and Ville Kauppinen are pleased with the rapid expansion of their company within the Turck Group

Identifying efficiency – this is the motto under which the Finnish RFID turnkey solution supplier Vilant Systems gained an excellent reputation, particularly in the logistics sector in Europe. The new company, with a name made up from the first syllables of the first names of both company founders, Ville Kauppinen and Antti Virkkunen, is headquartered in Espoo, Finland, and currently has over 50 employees in four countries. Since its founding in 2002, Vilant Systems has already implemented over 1000 RFID system installations in 35 countries. Its significance on the market for the industrial RFID system business is suitably large.

Global expansion

The founders had for a long time aimed at achieving global growth as quickly as possible and strengthening their market position accordingly – an intention that would have taken a very long time to achieve if it had been done organically with their own funds. They consequently looked at one or two corporate partners, but never found the right one that would understand the independent corporate culture at Vilant Systems as a valuable asset, and didn't want to fully integrate the young company straight away.



Using in-house software solutions and a lot of application know-how, Vilant Systems has become one of the most successful RFID system houses in Europe

With Turck, this was completely different. After both companies had worked well together in projects, a closer collaboration could be envisaged on both sides. After a number of talks, it became clear how this ought to look like: Turck would take over the majority of

shares of the former RFID turnkey solution partner, which would remain an independent company within the Turck Group. A transition process has been in place since October 2017, after which the company will be called Turck Vilant Systems from January 2018. With this transaction Turck is strengthening its activities in the software, system and service business, which is of great strategic importance with regard to Industry 4.0 and the Internet of Things. The takeover also represents Turck's response to the growing demand for complete system solutions.

Vilant Systems will now enable Turck to offer turnkey RFID complete solutions in addition to the hardware business. "Our customers not only require excellent hardware products, but also an increasing number of complete system solutions, such as software, integration and maintenance, particularly in the RFID business," managing director Christian Wolf explains the decision. "The experienced specialists at Vilant will enable us to better meet these requirements and support our customers on the way to Industry 4.0. We are very pleased to welcome the Vilant team of around 50 employees on board."

The two founders, Ville Kauppinen and Antti Virkkunen, continue to remain shareholders and managing directors of the new Turck Vilant Systems. Ville Kauppinen: "The decision to become part of the Turck Group was not only made on account of Turck's financial and technological strength, but also due to its global corporate strategy. Vilant was founded with the aim of growing internationally. Turck has been successfully pursuing this aim for fifty years and has a strong international presence. In the Turck Group we can continue our RFID system implementation business as usual and use Turck's worldwide sales organization, as well as the hardware product portfolio for further international growth." Antti Virkkunen, managing director for Central Europe, also added: "Vilant sales will support the Turck sales organization through its know-how and new project contacts. For this all subsidiaries will be trained by Vilant experts in order to also offer Turck customers worldwide leading RFID system solutions."

Versatile software portfolio

Vilant Systems is today already serving the typical focus sectors for RFID system solutions, such as asset tracking, rail, supply chain as well as pulp and paper. The portfolio focuses on the area of software. In terms of hardware, the company always uses the solutions with which the particular task can be implemented best of all. The software is developed entirely in-house and adapted as required for specific projects. The portfolio contains different software solutions that are suitable for devices with or without a user interface. While the Vilant Engine is the right choice for devices without a user interface, the Vilant clients, Gate Client, Handheld Client or Forklift Client, are designed for devices with a user interface. The Handheld Clients, for example, are suitable for RFID handheld devices for the manual reading or writing of the RFID tags, Gate Clients are used for automatic tag detection and Forklift Clients



on the operator terminals of forklift trucks. Each device software also features direction detection and stray read filtering.

All Vilant solutions can be passed on via WLAN, LAN, GPRS or also 3G to the Vilant server software, such as the Visibility Manager, the Device Manager or individual modules. For example, the Visibility Manager is the product designed for the asset tracking sector. This improves user friendliness and the control of assets. SCM processes are also visible in real-time. The Vilant RFID software enables plug and play implementation and is also suitable for high volume applications. Besides the software, Vilant Systems provides its customers with 24/7 support and maintenance, as well as the development and implementation of RFID software and devices.

Takeover with added value

All participants benefit from the first company takeover in Turck's corporate history: Vilant can offer its services in future worldwide to all Turck subsidiaries and Turck is one more step on the way to being worldwide automation partners. The customer also benefits since with Turck Vilant Systems within the Turck Group, they have a genuine turnkey solution supplier for all aspects of the Industrial Internet of Things and Industry 4.0.

Info | www.turckvilant.com

Not a commonplace occurrence with a company takeover: The number of employees at Turck Vilant Systems will increase considerably in the near future

QUICK READ

Corporate takeovers often leave behind an unpleasant aftertaste on one side or the other. Not so with the recently completed majority interest of the Turck automation specialists in the Finnish RFID turnkey solution supplier Vilant Systems. Under the name Turck Vilant Systems, the new company is an independent member of the Turck Group. Turck customers worldwide will thus benefit in future from the software and application know-how of the Finns, which has allowed them to become one of the most successful suppliers of turnkey RFID solutions on the market.

Trade Shows

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

Date	Trade Show	City, Country
12.12. – 14.12.2017	Elektro Vakbeurs Hardenberg	Hardenberg, Netherlands
13.03. – 15.03.2018	Logimat	Stuttgart, Germany
20.03. – 23.03.2018	Amper	Brno, Czech Republic
22.03. – 23.03.2018	Automaticon	Warsaw, Poland
16.04. – 19.04.2018	Neftegaz	Moscow, Russia
17.04. – 20.04.2018	SIAMS	Moutier, Switzerland
23.04. – 27.04.2018	Hannover Messe	Hanover, Germany
25.04. – 26.04.2018	ISA/AEC Automation Expo & Conference	Edmonton, Canada
02.05. – 04.05.2018	Fabtech	Mexico City, Mexico
15.05. – 17.05.2018	Smart Automation Austria	Wien, Austria
15.05. – 18.05.2018	Industry Days	Budapest, Hungary
22.05. – 24.05.2018	SPS IPC Drives Italia	Parma, Italy
22.05. – 25.25.2018	Gas.Oil.Technologies	Ufa, Russia
29.05. – 31.05.2018	Eliaden	Lillestrom, Norway
05.06. – 08.06.2018	Expo Pack	Mexico City, Mexico
28.08. – 30.08.2018	Sindex	Bern, Switzerland
02.10. – 05.10.2018	World of Technology & Science	Utrecht, Netherlands
23.10. – 26.10.2018	Congreso Minero Sonora 2018	Hermosillo, Mexico
13.11. – 16.11.2018	Adipec	Abu Dabi, United Arab Emirates
20.11. – 22.11.2018	Automation	St. Petersburg, Russia
21.11. – 24.11.2018	EMAF	Matosinhos, Portugal
27.11. – 29.11.2018	SPS IPC Drives	Nuremberg, Germany

The Net

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

www.turck.com



Sites

With 28 subsidiaries and more than 60 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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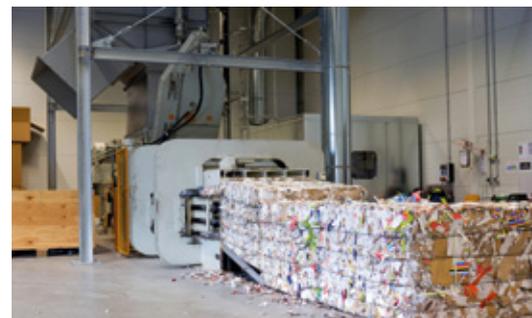
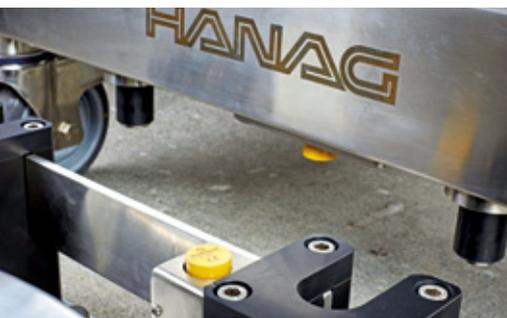
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