IO-Link Series Growing

Turck has extended its comprehensive IO-Link portfolio with three new product series featuring the communication interface: inductive proximity switches, contactless encoders and laser distance sensors

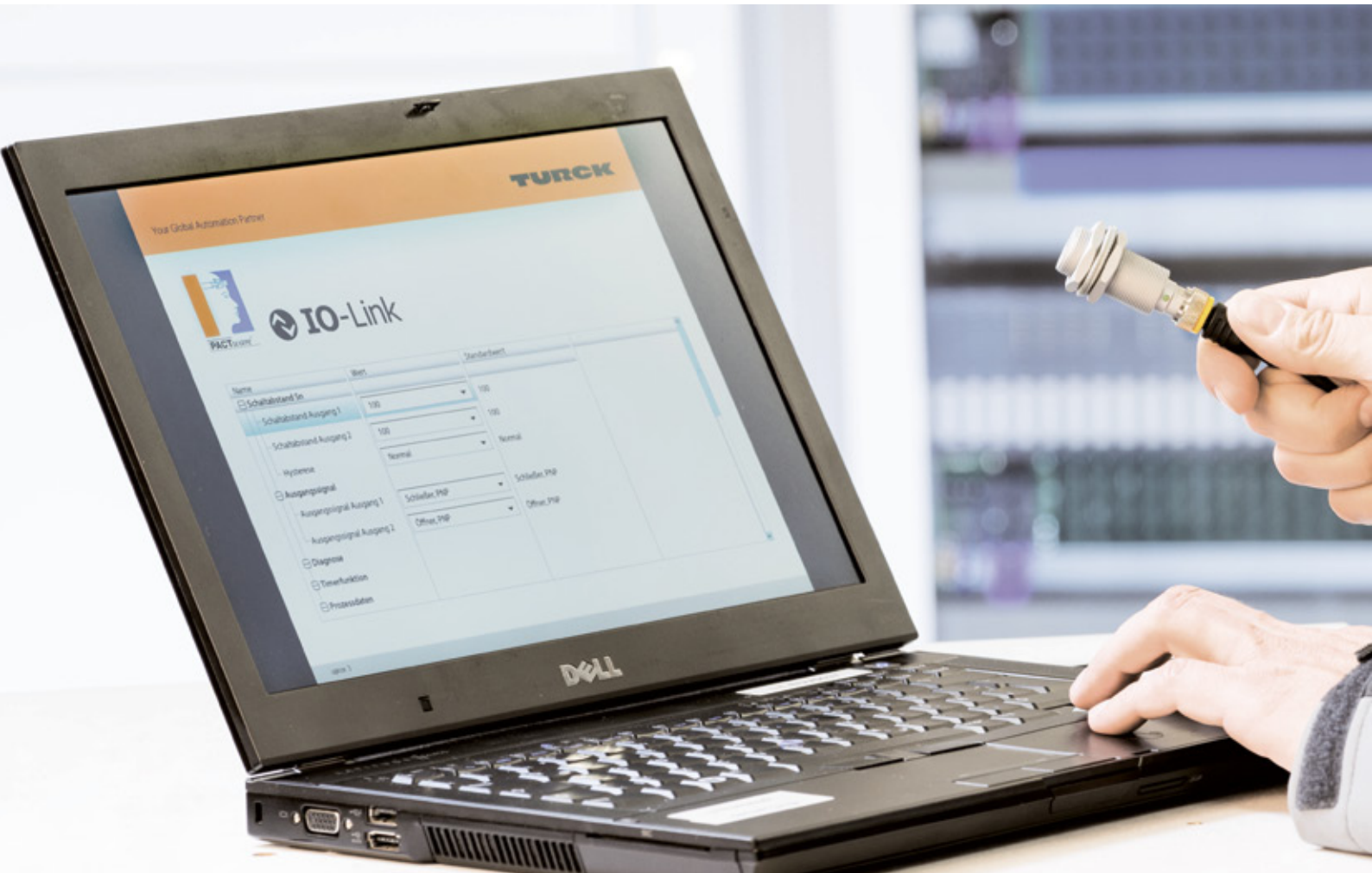
Interest in IO-Link has been gathering pace considerably in the wake of Industry 4.0. This technology has been available since 2006. While there has been a long debate about the pros and cons of this technology, many users today are convinced of its benefits. There are now around 2.2 million IO-Link nodes installed and recently the trend is growing. From 2013 to 2014 alone, the number of nodes virtually doubled. Users today implementing IO-Link have already fulfilled the basic requirements for a fully automated factory. The possibility to implement the forwarding of sensor data to higher-level ERP systems is thus already in place with IO-Link. For a new technology to be established, suppliers must offer in their portfolio components for all levels of the automation pyramid. This has now become the case with IO-Link.

The IO-Link technology has played a key role in product development at Turck since the very beginning, so that the Mülheim automation specialist can offer today probably one of the most comprehensive IO-Link portfolios on the market – from the simple programmable fieldbus module right up to the intelligent field device. At the SPS IPC Drives fair Turck will once more be underlining the sensor area by showcasing three of its most innovative new developments now also with IO-Link: The uprox3 inductive proximity switch, the QR24 contactless encoder and the laser distance sensor of its partner Banner Engineering. For all devices, the IO-Link variant now presented is exploding the range of possible applications and considerably simplifying handling. IO-Link turns the simple proximity switch into a multifunction sensor that also includes the possibility of identification

With IO-Link the uprox 3 will be the Swiss Army knife of inductive factor 1 sensors

Standard I/O mode: Two adjustable switch points

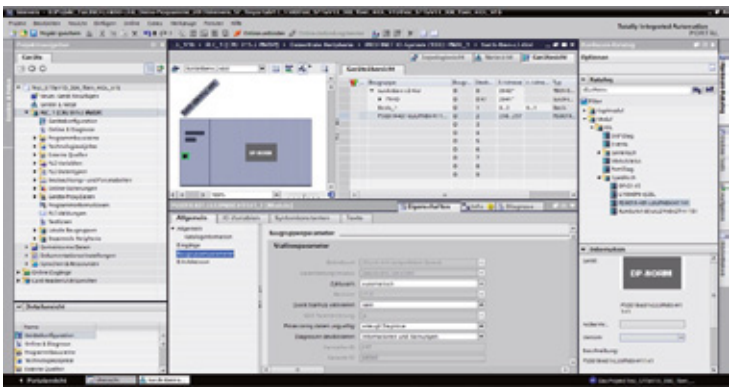
Turck's uprox3-IOL offers two operating modes. In IO-Link mode the sensor is operated on an IO-Link master, and in standard I/O mode on the conventional



digital input of an I/O module or controller. In this case IO-Link is only used for configuration purposes. In standard I/O mode two sensor switch points can be set individually and independently of each other. The actual points can be set in 10% steps from 10 to 100 % of the rated operating distance. If previously you had the choice between a 5 or 8 millimeter switching distance, it is now possible to set the sensor precisely – the switching distance of a BI8U, for example, can be set to 8 mm, 7.2 mm, 6.4 mm down to 0.8 mm. This may be particularly necessary for targets with a large tolerance in order to prevent damage and switching errors at the same time. It also simplifies mounting. The user mounts the sensor to achieve the best possible fit first of all and only then sets the switch point for the target.

The switching behavior of both switch points can be set either as an NC or NO contact as well as an NPN or PNP independently of each other. A startup delay as well as the hysteresis of the sensor can also be set. The M12 variant of uprox3-IOL is factory set with a PNP changeover contact and a switching distance of up to 6 millimeters. This is up to 10 millimeters on the M18 variant.

The second switch point allows customers to monitor wear information in addition to the actual detection task of the sensor. For this a switch point is set at the optimum distance from the target. The user selects the second switch point in order to detect early on if there is any severe wear on the target. This enables you, for example, to replace brake pads before there is a risk of a machine downtime.



User-friendly Turck IO-Link master: In the TIA Portal all the parameters which are already defined by the selection of the respective devices are grayed out when displaying the extended station parameters

The uprox3-IOL can not only be set to IO-Link mode, but also to standard I/O mode for very specific detection tasks. This makes it possible, for example, to implement rotational speed monitoring applications by setting an off delay. With a rotating target, the sensor is switched off for the duration of one revolution. The sensor is then reactivated and the target would have to be located in front of the sensor again. If this is not the case, the sensor switches off and the user knows that the speed is no longer correct. Thanks to its pulse divider function, the sensor can also reduce up to 128 input pulses to just one pulse, which is passed on to the controller.

IO-Link mode for identification tasks

In IO-Link mode, the uprox3-IOL is operated on an IO-Link master. The second process value byte can even be used here for identification tasks. In this case, the uprox3 writes part of the so-called application specific tag as an identification number to the second byte of the 16-bit IO-Link signal. Workpiece carriers on which a proximity switch checks the correct position of the workpiece can be identified automatically. And this can also be carried out without any additional IO-Link call, but deterministically as part of the cyclic data. If

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The more talk there is about Industry 4.0, the more IO-Link is also becoming a hot topic. No wonder, since the communication interface brings some real benefits for the user. With the right concept, clever IO-Link devices combine cost efficiency with flexible setting options. Turck is presenting the proof of this with the premiere of three new devices at the SPS IPC Drives fair: With the uprox3 inductive proximity switch, the QR24 contactless encoder and the Q4X laser distance sensor, the IO-Link specialist has added three more product variants to its IO-Link portfolio.

Using the "Application Specific Tag" each uprox3 IO-Link sensor can be individually identified

IO-Link facilitates parameterization of the laser distance sensor Q4X at hard to reach places

The QR24 IO-Link works reliably with inexpensive standard three-wire cables

required, the IO-Link call can be used to read out all the characters of the application specific tag in order to use more complex ID information.

Integrated temperature monitoring

The uprox3 also provides information in the cyclic data about whether the actual temperature is above or below the set temperature range – also according to customer requirements. The precise value of the integrated measuring sensor can be called via the controller as part of the acyclic information. The integrated temperature monitoring thus enables predictive maintenance, such as for the early detection of faulty cooling or when the motor is running hot.

Customer benefits

The versatile setting options enable customers to reduce the number of different types required, reduce costs for procurement and inventory levels. In the future they can purchase just one sensor as a universal solution, which can be set as required for specific applications via IO-Link. The IO-Link variant is only negligibly higher in price than the conventional uprox3 sensor. The integrated identification feature

enables anyone wanting an alternative and simple identification solution to save the costs of acquiring an RFID or barcode system. The uprox3-IOL is initially available as an M12 and an M18 variant in two housing designs: both in the chrome brass housing as well as in the PTFE coated variant for welding applications.

First contactless encoder with IO-Link
Turck's QR24-IOL single-turn encoder offers similar benefits thanks to its IO-Link interface. The new QR24 model is the first contactless encoder with an IO-Link output. Previous IO-Link encoders only used the technology for setting parameters. If IO-Link is also used as a data interface, as it is on both the QR24 and the Q4X laser distance sensor, the user can make some effective cost savings. Expensive shielded or twisted pair cables, as required for conventional analog signal transmission, become a thing of the past. IO-Link works reliably with inexpensive standard three-wire cables. Turck is continuing this approach consistently with the pricing of the QR24-IOL. It is consequently cheaper than the variants with analog, SSI or other digital interfaces.

Freely selectable zero point
Besides the cost saving benefit, the QR24-IOL boasts some clever parameter options. The user can set the zero point of the encoder as required. It was often necessary before to make compromises in mounting and commissioning. This sometimes meant that the terminals were difficult to reach or the diagnostic LEDs were hardly visible even though the zero point was correct. Alternatively the encoder could also be mounted without a correct zero point alignment. Users nevertheless had to store correction factors in their controller. The freely adjustable zero point of the QR24-IOL eliminates both these disadvantages. The orientation of the encoder can also be selected – either clockwise or counterclockwise (CW or CCW).

LED status indication
The QR24-IOL encoder variant also enables predictive maintenance. Besides the 16 bits which are output as a position signal, the encoder also transmits 3 bytes of status information. These increase the diagnostic coverage and indicate whether the positioning element is measuring correctly or not, or is being operated in the border area. This information can also be provided early on via the controller, if blows or shocks have caused the encoder or positioning element to become loose prematurely – and before a signal failure occurs. LEDs directly on the encoder show this information also and thus simplify diagnostics in the field and the correct mounting of the positioning element.

Q4X laser distance sensor
Turck's photoelectric components partner Banner Engineering also supports the IO-Link activities of its Mülheim partner and is launching on the market the Q4X laser distance sensor, another IO-Link device. It is the first device of its kind to combine two operating modes that previously were always used separately: Contrast sensing and adjustable background suppression. The user can set the mode and other parameters such as switch window and foreground and background suppression, as well as predictive maintenance, directly in the field via the display or via IO-Link. The communication interface here also considerably simplifies parameter setting at locations that are difficult to access.

New parameter sets when replacing devices
The benefits for parameter setting in particular are also provided since IO-Link version 1.1 is now available and supports all new Turck sensors. When a replacement is necessary, the IO-Link master simply copies all the stored parameters to the identical replacement device. Employees do not require any special training to carry out the replacement and operation can continue without interruption. Particularly in the event of unscheduled machine failures, this intelligent data retention feature can considerably reduce costly downtimes.

System expertise in IO-Link
Customers continuously using IO-Link as a data interface benefit from Turck's many years of experience with this technology. Turck has now integrated the setting options of all in-house IO-Link devices in the station GSDML file of the TBEN-S master. This considerably simplifies the setting up of a system via the PLC. 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. Both the individual parameter setting of devices via a PC as well as the manual writing of an IO-Link call program block in the controller thus become unnecessary.

This provides a user-friendly solution to the integration of the IO-Link devices. When advanced station parameters are displayed in TIA Portal, all parameters which were previously specified by selecting the particular device are grayed out. The remaining unspecified parameters can then be selected easily via drop-down fields. The integration of the IODDs also simplifies the documentation and commissioning of machinery. If a device is connected to the wrong input, this is detected by the controller – also if the device is replaced at a later time. Any annoying connection faults arising during commissioning and servicing can be detected quickly. The diagnostics of devices during operation is also easier since each individual sensor can be accessed without any programming effort.

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