PROFINEWS

PROFIBUS & PROFINET news from around the world

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IO-Link - a Success Story!

by Carl Henning - Monday, February 06, 2017

http://profinews.com/2017/02/io-link-a-success-story/

IO-Link is impressively demonstrating a rapid rise in acceptance and dissemination in various automation engineering applications. Since the broad market launch in 2009, this technology has written a success story. Not only were the growth rates of IO-Link devices exceptional in recent years but also the number of members increases continuously. So at the beginning of 2017 more than 140 member companies are working within the IO-Link Community to develop and market the technology. A steady increase in the number of members means an ever-broader base of components. Due to the systematic and forward-looking further development of the specification numerous and varied new products can be expected. For example, the specification of an IO-Link Safety protocol has been completed and is currently undergoing an assessment phase involving TÜV Süd. Based on the IO-Link Safety protocol, safety products are being developed that are connected to the different systems via IO-Link and thus allow all advantages of the IO-Link technology to be utilized.

In a different area product developments may be expected as well. A new profile for smart sensors was made available at the end of 2016. It offers solutions for intelligent sensors with IO-Link that will increase flexibility and productivity in automation systems through the increasing integration of functions.

Another topic that will further spur on the success of IO-Link includes wireless connectivity for IO-Link devices. A working group has been working on the topic for some time and will present its status in the near future.

Through the highly dedicated community, these enhancements will also progress quickly and will further increase the attractiveness of IO-Link technology. You may look forward to many new powerful and efficient IO-Link products. PROFINEWS will keep you informed on these!

Reinhard Schlagenhaufer
Speaker of the IO-Link Steering Committee

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PROFINET Help Wanted

by Carl Henning - Monday, February 06, 2017

http://profinews.com/2017/02/profinet-help-wanted/

PI North America is looking for an automation engineer with excellent oral and written communications skills. At PI North America we write white papers, make videos, teach free PROFINET one-day training classes, blog, tweet, Facebook, LinkedIn, edit PROFINEWS, and engage individually with users and developers of automation devices. We are looking for help with some of these things. The position is based in Scottsdale, Arizona. Automation experience is a must, PROFINET or PROFIBUS experience would be a bonus.
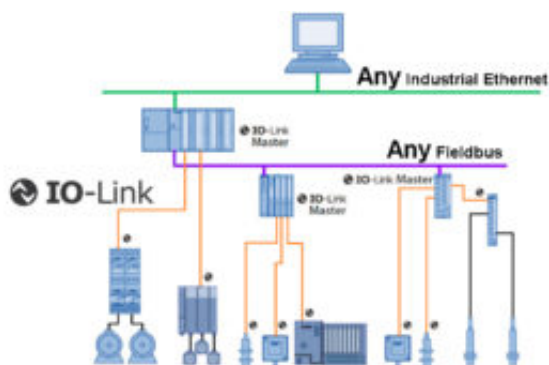
For more details and to apply visit http://us.profinet.com/careers/

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IO-Link: Did You Know

by Carl Henning - Monday, February 06, 2017

http://profinews.com/2017/02/io-link-did-you-know-18/

Did you know that IO-Link can be integrated into any fieldbus system?

One of the most important features of IO-Link is its fieldbus neutrality. It allows the IO-Link functionality to be connected to nearly any fieldbus. Either the standardized mappings in fieldbuses, e.g. for PROFIBUS, PROFINET, EtherCat, and Sercos, or manufacturer-specific mappings for EtherNet/IP, CANopen, Modbus, CC-Link, and AS-Interface can be used for this. IO-Link is also recognized as an international standard according to IEC 61131-9 and thus has gained acceptance worldwide, independent of the respective prevailing fieldbus system. Therefore, users can count on IO-Link to provide an internationally accepted solution with long-term reliability which is appropriate for all automation environments. This entails high investment protection for manufacturers and users – particularly with a view to future applications.

Further, a comprehensive fieldbus and controller-independent description (IODD= IO Device Description) has been standardized. With this, it is possible to enable any engineering tool to provide the associated plain text description electronically for device-specific properties such as process image, parameters, or diagnostics. This allows central access to all IO-Link devices from a single tool.

Every IO-Link device can be identified uniquely on the basis of its internal data. This is an important element for quality assurance and the functionalities related to Industrie 4.0. Besides digitalized secure and lossless measured value transmission to the machine controller, additional information can enter the ERP system in this way. Thus IO-Link enables the required consistency from the control level to the automation level (fieldbus/Ethernet) up to cloud applications.

IO-Link

IODDfinder, the IO-Link Data Portal for IODDs

by Carl Henning - Monday, February 06, 2017

http://profinews.com/2017/02/ioddfinder-the-io-link-data-portal-for-iodds/

The IO-Link community has released a central database for IO device descriptions. This valuable service provides a big advantage, not only for IO-Link members but also for users of the IO-Link technology. IO-Link vendors will have the advantage of a consistent and up-to date pool for IODDs and users will find the IODDs of all existing devices in one central place on the internet - surfing sessions through vendor specific homepages is a thing of the past.

A Device Description is a software based description of the device functionality. As this is not an executable program, the IODD is not like driver software but is rather recognizable as a template for the function of a certain IO-Link device. The IODD is an essential part of an IO-Link device and therefore it is important that it be accessible to the user.

A centralized, cross-vendor database for IODDs is a historic demand of IO-Link users. For this reason, the IO-Link community defined a project to fulfill this strong demand. This project has now resulted in the new online-service called IODDfinder, which can be reached via the IO-Link homepage or directly by following the link: https://ioddfinder.io-link.com

The start page of the IODDfinder shows a search bar to insert a certain manufacturer, article number, or product type of the desired IO-Link device. After entering these search parameters, a result list displays

the relevant products. The user is able to browse through the results and will get detailed information by clicking the assigned product line. This information contains a product picture and a vendor logo as well as the desired IODD as a ZIP file for download.

Besides the manual handling of IODDfinder there is the possibility to create a software interface to access the online database. This means that IO-Link configuration tools could have an automatic link to all published IODDs and be able to select the desired device description on demand. The use of IODDfinder is free of charge for users and members. Members are able to get a free account for the database by applying via email at IODDfinder@io-link.com. They will find different ways to upload and maintain their IODDs. Beside this, the operating technology partner cluetec GmbH, provides additional services to connect a company data system automatically to the central data pool of IODDfinder. More information is available by clicking on the "cluetec" logo at the bottom line of the IODDfinder page.

The new service already hosts more than 3500 IO-Link devices from 38 manufacturers. This compendium gives IO-Link users a very good overview of the broad range of available IO-Link devices – not only sensors and actuators but also useful IO-Link accessories. In addition, it provides manufacturers the opportunity to give more background information on certain IO-Link devices.

The IO-Link community is very happy to offer this valuable service for both parties, their members to provide a high quality and consistent data platform for IODDs and all technology-user to serve a central drop-in center for more information about available IO-Link devices and their accessories.

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IO-Link Simplified Firmware Updating

by Carl Henning - Monday, February 06, 2017

http://profinews.com/2017/02/io-link-simplified-firmware-updating/

New possibilities for IO-Link through firmware update
IO-Link firmware update profile simplifies the updating of device software

The intelligence and complexity of sensors and actuators is constantly increasing, not just within the scope of Industrie 4.0. Today, even the smallest sensors have a powerful microcontroller and several thousand lines of software code. Firmware updates may occasionally be necessary, for example, to enable new functionalities or to add newly supported profiles that were not yet known when the device was developed. To meet these needs, the IO-Link community has specified a firmware update profile.

At present, IO-Link is the only communication protocol that supports a uniform, vendor-neutral, firmware update mechanism. The firmware update profile is currently implemented by various manufacturers of IO-Link devices and uses the newly developed BLOB transfer (Binary Large Object) for the transfer of large quantities of data. In the future, it will be possible to perform firmware updates quicker and easier.

The manufacturer of the device provides a special file (*.iolfw) for the firmware update. In addition to the actual device software, this file also includes additional information; e.g., for verification purposes or even with information for the customer. With the IO-Link profile, tools for the parameterization of the master for the firmware update can also be developed. With such a tool, the user can open the provided file and start the update process. The tool then checks whether the firmware and the device are compatible. If authentication was successful, the tool switches the device to bootload mode and starts the actual transfer and storage of the new software in the device. At the end of the process, the status of the update is displayed and, if the update was successful, the device is restarted to allow the new functionality to be used in the system. The update of a typical device takes less than one minute.

To guarantee both a high level of security as well as simplicity, the profile was developed according to strict guidelines. Thus, new firmware images – among other things – may only be written to compatible devices. In addition, updating of the software must function via standard IO-Link wiring in the field. Thus, no special IO-Link masters are needed for this purpose. Lastly, the new software can only be written to the device; it cannot be read out. And, should something actually go wrong when transferring the new software, every device offers a small bootloader for starting the process a second time.

If firmware updates are desired, they can now be performed much quicker and easier with a new IO-Link profile. Image: Festo AG & Co. KG

IO-Link

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IO-Link Wires Core Shooter Machine

by Carl Henning - Monday, February 06, 2017

http://profinews.com/2017/02/io-link-wires-core-shooter-machine/

Laempe Mössner Sinto GmbH uses IO-Link in a new core shooter machine and achieves shorter cycle times with Turck's QR24-IOL IO-Link encoder

When the foundry machinery manufacturer Laempe Mössner Sinto planned the new LHL machine series, it decided to implement the entire automation for this with IO-Link. This produces several benefits: Besides costs, the manufacturer also saves the time required for the installation, wiring and electrical planning, while customers benefit from a more dynamic and faster machine. Faults occur less often and can be diagnosed and rectified more easily. The swing movement of the core box carrier has a major influence on the cycle time of the machine, and this can now be measured by Turck's QR24-IOL contactless IO-Link encoder.

Laempe Mössner Sinto is a global leader in core shop technology for the foundry industry and one of the few manufacturers of core shooters worldwide. The machines produce sand cores for metal casting. If, for example, the casting of an engine block is required, cores are placed inside the casting mold to later produce the cavities of the engine. A key objective of core shooter manufacturers here is short cycle times.

IO-Link enables innovation leap

The new LHL machine generation is an innovation leap in terms of its automation. "We have incorporated many intelligent components in our machines, which before normally had a bus connection. This meant that we had to connect the operating voltage and two bus lines individually to a positioning system. All three lines were run on drag chains and were consequently put under severe stress," Lipsdorf describes the previous wiring.

IO-Link rectifies many of these disadvantages: the two bus lines plus power supply are replaced with a standard three-wire cable which is run in the drag chains of the LHL30. All intelligent analog sensors and devices now have an IO-Link interface and are connected to the PLC via an IO-Link master, while simple proximity switches and digital actuators are connected via IO-Link-capable hubs. Sixteen switch signals can be connected via a standard three-wire cable, which keeps wiring effort down to a minimum and also enables the implementation of basic diagnostics for the proximity switches.

End position detection problematic

The upper part of the core box on the core shooter can be swung 90 degrees out from its production position to a maintenance position. The swing movement was previously detected with end position switches. This solution wasn't without its problems, as Lipsdorf explains: "Even if we only detected the end positions, it was difficult to find a suitable point for mounting the sensors. In order to detect the exact position, the design required us to fit initiators on the outside. However, the available mounting space for

the required holders was limited."

IO-Link encoder detects swing of upper core box

The solution was to detect the entire swing movement. If the rotation movement was detected at the axis of rotation, one bearing point for mounting the encoder was guaranteed, without the need for any additional supports. "For this we looked for an encoder which was as robust as possible, i.e. with contactless operation, and which had an IO-Link output. Turck's QR24 encoder met all our requirements and successfully passed all our tests, so that we no longer had to look any further," electrical planner Andre Klavehn, describes the fast product selection process.

Click a thumbnail image for full size picture:

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IO-Link encoder detects swing of upper core box

RFID: Simply (cost-) Efficient with IO-Link

by Carl Henning - Monday, February 06, 2017

http://profinews.com/2017/02/rfid-simply-cost-efficient-with-io-link/

A renowned manufacturer of sophisticated mechatronic products relies on RFID technology integrated into production processes via IO-Link. The manufacturer utilizes this technology in the – for the first time – modularly designed module and final assembly of the power electronics units for premium electric cars. The mobile data storage devices are suitable for the increased temperatures encountered during casting.

With the power electronics unit, the Zollner Elektronik AG manufactures and assembles the electronic heart for a well-known electric car series at its headquarters in Zandt, Germany. To this end, the mechatronics service provider has constructed a modularly structured module and final assembly in a clean room.

RFID technology from Siemens contributes to the perfectly coordinated process flow across various manual and partially automated workstations. Crucial for the selection of the Simatic RF200 system in the IO-Link interface variant in conjunction with mobile data storage devices of the type MDS D160 were the easy connection to the module controllers, the low system costs, and the high temperature resistance of the tags.

The clean room houses the printed circuit board production utilizing surface-mount technology and/or through-hole technology (SMT/THT) followed by the module assembly and final assembly including various inspection and testing stations. Zollner has chosen a modular design for the lines throughout with independently controlled stations that can be employed flexibly and later be modified easily for continued use. Reliability and durability in conjunction with the availability of replacement parts were important aspects in the selection of all components.

Tracking and Tracing

Altogether, there are about 100 reading points in the module assembly and final assembly production flow control and for the immediate documentation of every completed step in overlaying databases. "For us as well as our end customers, quality is the top priority, which has to be fully documented and traceable across all processes," says Bernhard Kirst, director marketing at Zollner. Because effort and costs have to stay within competitive limits, the readers Simatic RF210R with integrated IO-Link functionality from the HF RF200 product range by Siemens were selected. They enable a connection to any controller complying with the IO-Link standard. The control system employed by Zollner offers a suitable IO-Link master module for that. The screw-type readers (M18 x 71 mm) with integrated antenna automatically supply the data read off transponders – here the unique identification number (UID) of the respective workpiece carrier. At the start of the line, the workpiece carrier is "married" to the base module of the power electronics. By means of the UID, the assembly is identified at every station, the required process step initiated by the controller, and for manual workstations, work instructions displayed to the employee. Relevant production data are immediately written back to the databases. Tracking and

tracing data are thus constantly collected, documented, and archived.

Transponder for increased Temperatures

The compact and extremely rugged HF readers with IP67 protection rating employ the radio interface protocol in accordance with ISO 15693 and can, in principle, read from and write to all standards-compliant mobile data media. Every time the transponders pass through the casting facility, they are subjected to a temperature of 100 °C for at least 20 minutes. "Not all transponders are capable of doing that on a continuous basis, and at a low price to boot," says the responsible electrical and software planner Andreas Meidinger. One that can do that without limitations is the mobile data storage device MDS D160 by Siemens. The ISO-compliant, hardened transponder is designed for use at temperatures up to 175 °C and has proven itself in industrial laundry facilities and other thermally demanding processes. For easy mounting, Zollner installs the chip-shaped transponders (Ø16x 3 mm) in plastic spacers. They are affixed either into the bottom or at the side of the circulating workpiece carriers. Two workpiece carrier variants each are in use for the charger and DC/DC converter assemblies – a simple one for thermally uncritical stations and one for increased temperatures for casting only. A robot automatically relocates the assemblies.

Proven in Practice

Zollner Elektronik AG has been manufacturing power electronics units since the end of 2012 – without a failure or malfunction. The RFID combination of reader and transponder selected has proven itself in daily operations and is now also being employed or specified for many other assembly systems. "In this instance, support from the supplier was not necessary, since all components are easy to use and – thanks to the IO-Link standard – can be integrated into a wide variety of controllers," states Andreas Meidinger.

The path of the assemblies through various manual and partially automated workstations is controlled by RFID readers of the type Simatic RF210R in the IO-Link variant by Siemens (left). The mobile data storage device of the type MDS D160 (in a spacer) is temperature-resistant up to 175 °C and thus suitable for applications such as the casting of electronic assemblies.Photograph: Zollner Elektronik AG

Industrie 4.0 - Intelligent Communication with Inductive Sensors

by Carl Henning - Monday, February 06, 2017

http://profinews.com/2017/02/industrie-4-0-intelligent-communication-with-inductive-sensors/

Through the use of intelligent inductive sensors from wenglor sensoric, a large German manufacturer of special machines has succeeded in reducing the number of sensor types required for his application by 50%. In order to detect the various positions of gripper arms which are used above all in assembly operations, it was previously necessary to use a great variety of sensor types.

Thanks to the IO-Link interface and ASIC circuit technology, type I12H020 sensors can be easily integrated into existing systems: "The sensors communicate actively via IO-Link and are known individually,"explains wenglor product manager Maria Boos. "In this way they can be easily and flexibly adapted to the respective application, as is the case here with the gripper arms," explains Boos.

The customer, who is primarily a supplier to the pharmaceuticals industry, was convinced by the intelligent communication capabilities, as well as the outstanding performance with a compact design (12 mm switching distance in an M12 housing) and the sensors' long service life (thanks to ASIC). "Our customers keep track of their systems and are additionally provided with better performance from a single sensor," adds Boos. "And they're well prepared for applications in tomorrow's smart factories as a result."

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Advanced PROFINET Features Pay Dividends: Alarms and Records

by Carl Henning - Monday, February 06, 2017

http://profinews.com/2017/02/advanced-profinet-features-pay-dividends-alarms-and-records/

For most folks jumping in to a PROFINET development project, there's one only goal that they have in mind: exchange cyclic real-time data with a PLC. That's the same task that every fieldbus in history has been designed around, and it comes with well-known drawbacks: devices that can only exchange data cyclically force developers to pack all sorts of data in to the real-time channel that doesn't belong there.

For example, think about a drive that may need to receive a tuning parameter when it first starts up, but doesn't need to continue receiving that parameter every cycle. Similarly, a smart camera may need to send an alarm if it detects an anomaly in a product, but it doesn't need to send data about a non-existent anomaly every cycle, either. Products like these waste resources two ways. First, they waste storage space in the PLC by trying to pack bytes in to the cyclic data exchange that don't belong there. Second, they create extra work for the application engineer who has to write custom code to interface with each of these devices.

That's where PROFINET stands out from other fieldbuses: it provides much more than just real-time communication. For instance, it provides event-driven alarms to push fault information to a Controller in a standardized, easy-to-parse format. Similarly, PROFINET also provides server-client communications via the Acyclic Records mechanism for one-off read or write operations. These features can help application engineers stretch their PLC resources further and make the most of their budgets.

By implementing these two mechanisms, developers can dramatically lower the implementation cost of their PROFINET devices. In addition to saving application development time and making more efficient hardware investments, implementing these features can give the end customer a much more robust and comprehensive system to work with. If you're interested in implementing those or other features in to your PROFINET product, check out our developer training and drop us a line. We'll be happy to help.
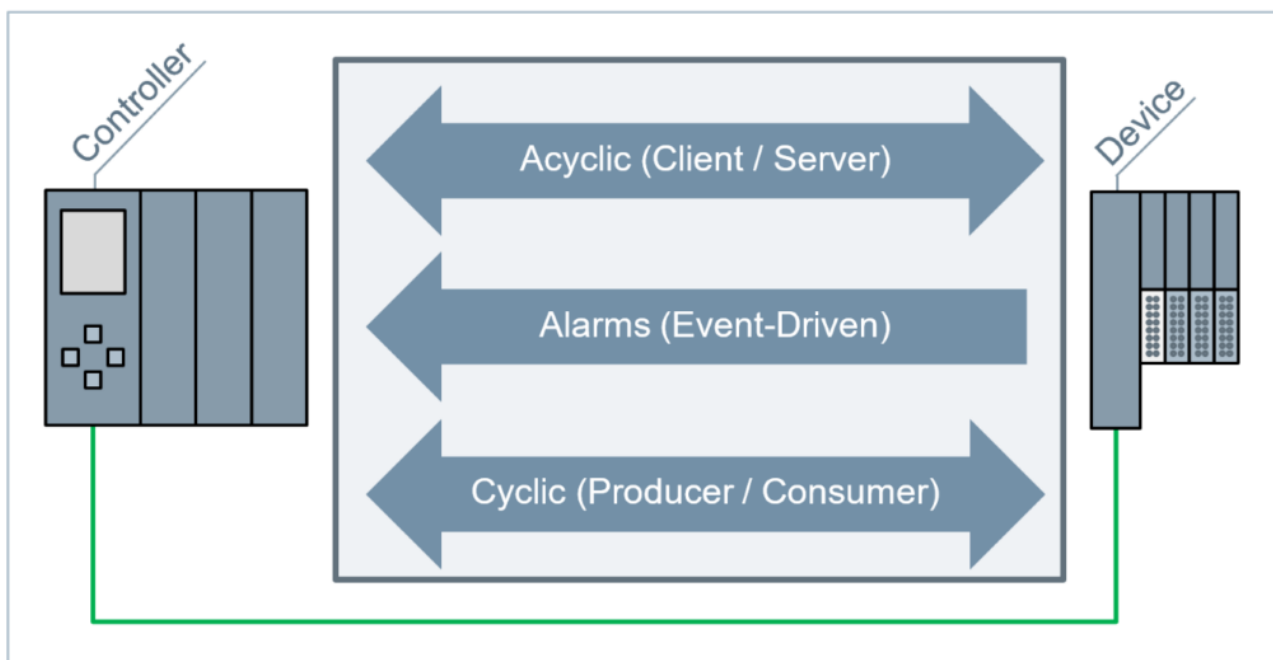
Figure 1- PROFINET provides three different communication channels to fit the data exchanged between Devices and Controllers

Kyle McMillan
PROFI Interface Center

Kyle provided an informal look at this situation in a guest PROFIblog post.

Product News - Issue 149

by Carl Henning - Monday, February 06, 2017

http://profinews.com/2017/02/product-news-issue-149/

Click on a headline for details

Ten companies present 15 new IO-Link products: Aventis, Balluff, Belden, Comtrol, Festo, GERMBEDDED, Leuze, M&M Software, Schmalz, and Turck.

Aventics IO-Link Pressure Regulator

With the electropneumatic pressure regulator EV03, **Aventics** increases the degrees of freedom for developers, simplifies system commissioning, offers flexible application, and decreases the variety of parts in storage. The IO-Link or an optional display can be used to change the regulator dynamics, regulator precision and pressure range, or for a manual pressure adjustment. This results in advantages in procurement, commissioning, and storage, as fewer different components are needed.

Four Balluff IO-Link Products

Balluff has introduced four IO-Link products (click for details):

1. Weld-immune IO-Link masters and sensor/actuator hubs
2. IO-Link Memory module
3. IO-Link sensor/actuator hubs in metal
4. Fieldbus modules with 4 IO-Link ports and multiple Industrial Ethernet connectivity

Belden's Two New IO-Link Modules

LioN-Power Multiprotocol I/O Modules from **Belden** are claimed to be the most versatile multiprotocol I/O modules on the market. This line also features new universal 16 digital in-/output (DIO) module options that give users the freedom to adjust the modules to any I/O configuration to meet the various needs of their systems.

The LioN-Power IO-Link Masters are fieldbus-independent, multiprotocol modules that ensure

consistent, intelligent communication between programmable logic controllers and smart devices that is necessary for IIoT. These modules provide enhanced flexibility with support for PROFINET and customizable port configurations that can manage digital inputs, digital outputs, analog inputs via IO-Link and smart devices – all in a single device. This allows users to easily connect devices to different systems and controllers worldwide.

Comtrol IO-Link Device Access to Multiple Controllers

Comtrol's MultiLink technology allows IO-Link Masters to simultaneously provide a sensor's process data to PLC platforms, while also sending the sensor's ISDO service and process data via Modbus TCP or OPC UA upstream to IIoT/Industrie 4.0 Cloud solutions or SCADA systems.

Festo Pressure and Vacuum Products

Festo Pressure sensor: The attractively priced pressure sensor SPAN is amazingly flexible thanks to switchable electrical outputs and a very wide range of options for pressure measurement ranges and pneumatic connections.

The compact design of just 30 x 30 mm, the range of variants
and the user-friendly menu navigation make the sensor suitable for
every kind of application. Remote maintenance and parameterization via IO-Link.

Vacuum generator: Integration for greater economic efficiency: the new modular vacuum generator series OVEM is here. It integrates into one unit a wide range of functions that can be individually selected. The new vacuum generator series starts with four performance classes and a built-in air saving function. The product is completely configurable for the respective application. The new, low-cost alternative with one switching output indicates whether the vacuum level has been reached. IO-Link Port type A, V1.1

IO-Link Analyzer

The IO-Link Analyzer from **GERMBEDDED** is a powerful tool for use in development, engineering and servicing of IO-Link based devices and systems. Inserted between IO-Link Master and Device, it records all communication and visualizes it in real time. You can immediately see what is really going on between the master and the device, or store the trace for later offline analysis.

IO-Link Field Master

The IO-Link interface is a first step toward Industrie 4.0. It is used to exchange the available process, configuration and diagnostic data directly with the control system. To achieve true Industrie 4.0 implementation, however, data does not only need to be made available in the control system but at the same time also has to be available at other levels all the way up to the cloud. For this purpose, **Leuze electronic** has designed an IO-Link field master which makes available the process and diagnostic data simultaneously via a web server.

IO-Link Parameterization Tool

The ioddINTERPRETER from **M&M Software** provides users of IO-Link with a configuration and parameterization tool with an optimized user interface. Due to the implementation based on the FDT® technology (Field Device Tool) as DTM (Device Type Manager) using this software tool is very user friendly. The fieldbus and manufacturer independence of FDT allows for unrestricted vertical connectivity through all fieldbus communication layers up to the sensor and/or actuator.

The ioddINTERPRETER was developed by a company group and is available to end-users free of charge via download. System vendors and device manufacturers can obtain further information about this product – also about integration – by contacting us directly.

IO-Link Pressure and Vacuum Switches

J. Schmalz GmbH claims to be the first company on the market to develop a new series of vacuum and pressure switches that open up completely new communication possibilities and make processes much more transparent. The VSi version is easy to integrate into systems and makes vital process data visible. The switch communicates with all conventional field-bus systems via IO link and also allows you to readout information using a smartphone.

Turck IO-Link Master in IP67

Turck's IO-Link masters offer some specifics: With SIDI the IO-link devices can be integrated with a drag-and-drop operation in the control project. Turck's TBPN is also the only block I/O module that transmits safe signals and IO-Link data on one line to the control.

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