

# PROFINEWS

PROFIBUS & PROFINET news from around the world

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## A Major Change in Communication for the Process Industry

by Carl Henning - Wednesday, August 02, 2017

<http://profinews.com/2017/08/a-major-change-in-communication-for-the-process-industry/>

Process system owners are always on the lookout for new, flexible production methods and customer-oriented business models. Profitability as a key aspect of industrial systems is always kept in view here. Against the background of innovations from Industrie 4.0, in particular, communication systems are the main driving force for increasing the profitability of these types of systems, which have to work for years without interruption in rough process industry environments. This being the case, the automatic interaction of different systems and components from different manufacturers must be continuously ensured and business processes between chemical companies, suppliers, customers etc. also have to run smoothly. Discussions about Industrie 4.0, networked production and intelligent communication promise great potential for new methods, processes and technologies.

### PROFIBUS PA

With PROFIBUS PA, PROFIBUS & PROFINET International (PI) has provided a successful basis for the transition to field communication digitalization. PROFIBUS PA enables long cable distances and explosion protection for the harsh environments of process automation and offers complete digital integration of field instrumentation in control and asset management systems.

As part of the further advancement of Industrie 4.0 and the Industrial Internet of Things, Ethernet (and thus PROFINET) will establish itself in process automation. PROFINET is fast, powerful, flexible, open, and offers a host of functions for the specific tasks of the process industry. This includes optimum redundancy mechanisms, "Configuration in Run" for smooth device swapping during operation and time stamping for the recording of event sequences etc.

### FDI (Field Device Integration)



The Industrie 4.0 model requires the option of standardized access to information from Industrie 4.0 components for other companies, machines, and systems. The recent introduction of FDI means that an attractive cross-manufacturer and cross-communication system technology for device integration is now available. The core of FDI is the specification of an architecture for so-called device packages for the digital representation of a field device. The device package contains a description of all data and functions of the device based on EDDL and the user interface (UI). FDI also defines an architecture for FDI host components which enables the processing of device packages in different FDI hosts simultaneously. This part, called the management shell, represents the digital

counterpart to the real-world object. FDI provides an excellent foundation for this.

## **PA Profile**

The PA profile defines the functionality and parameters for process-related devices such as transmitters, actuators, valves, and analyzers, enabling these devices to be adapted to the respective application and process conditions. It has been available for years for PROFIBUS, and approval for PROFINET is expected this year. All the parameters and functions specified in the PA profile will also be usable for PROFINET devices. This means that the strengths of PROFIBUS PA in the areas of diagnostics, parametrization and life cycle management will also be offered through PROFINET for process automation in the near future.

## **APL (Advanced Physical Layer)**

The only thing still missing is a solution with which PROFINET devices can also be provided for use in hazardous areas and in two-wire technology for supplying power over the line (similar to PROFIBUS). For this purpose, a corresponding physical layer for Ethernet-based communication known as the APL (Advanced Physical Layer) is being created as part of a joint project by well-known industrial companies and organizations and in which PI is taking a leading role. Requirements are coordinated with end users in the process automation field, and the specification is made in accordance with an IEEE standard (IEEE802.3cg PHY - Extended Reach/Single Twisted Pair). The goal here is a standardized PHY which fulfills the requirements of process automation.

## **OPC UA**



Another important aspect for systems of the Industrie 4.0 generation is OPC UA, especially when it comes to communication with devices such as operator stations on or above the control level or when it concerns production data from the devices to the company's IT. OPC UA's role here is to handle non-deterministic communication between different types of devices on a single level and between levels. PROFINET handles the transmission of deterministic real-time data in automation systems. PROFINET and OPC UA supplement one another perfectly here, as PROFINET can provide an open communication channel for TCP/IP. The options for using OPC UA are defined jointly with the OPC Foundation.

By integrating and utilizing a variety of different technologies, PROFINET will offer a standard solution for the process industry, from the field to the control system.



Dr. Peter Wenzel

PI Technical Director

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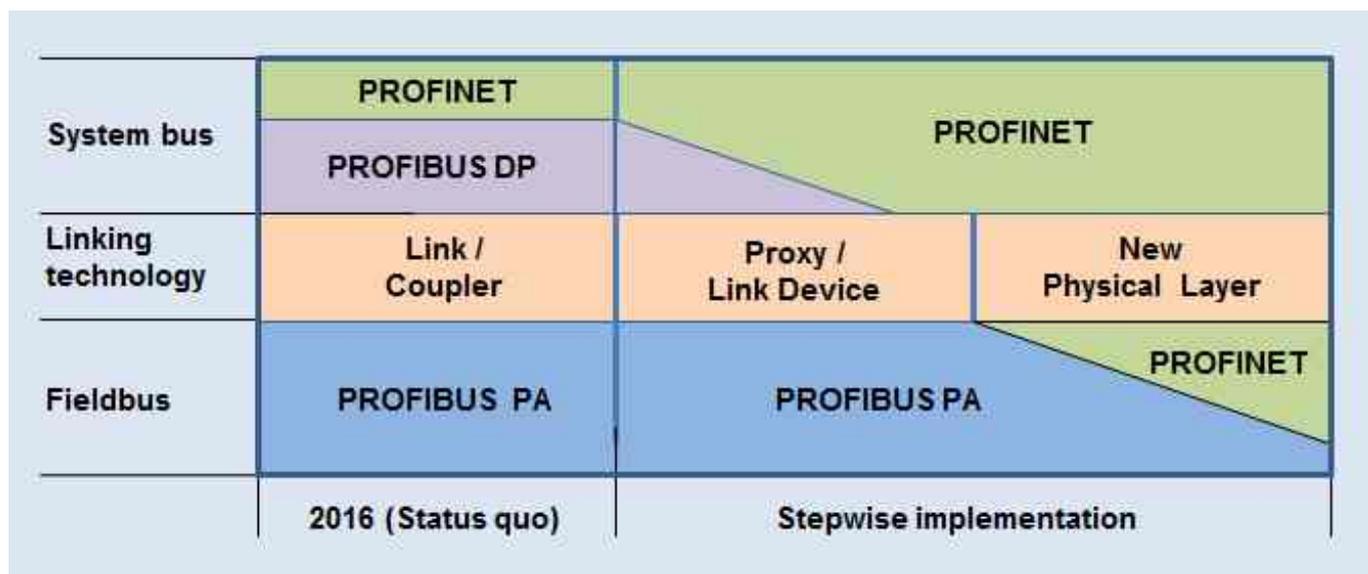
## PROFINETS in Process Automation - The Specifics

by Carl Henning - Wednesday, August 02, 2017

<http://profinews.com/2017/08/profinet-in-process-automation/>

*Whether it's called Industrie 4.0 or the Industrial Internet of Things – digitalization has long since encompassed all industry sectors and brings with it new business opportunities, but also new challenges. Only by consistently taking advantage of all available data is it possible to exploit all the savings potential and open up new possibilities. That applies to the process industry in particular.*

Operational excellence in production requires running production at an optimal level and permanently ensuring the availability of the plant. Furthermore, devices in the field are expected to transmit status signals for maintenance and diagnosis and parameter data, in addition to the actual measurement and control values, in order to allow comprehensive plant asset management. Even though the corresponding NAMUR Recommendation 129 is from 2009, plant asset management is far from standard even today. Modern Ethernet-based fieldbus systems come into play as an enabler.



The transition from PROFIBUS to PROFINETS in process automation is made gradually in coordination with manufacturers and users. Investment protection has high priority. The result is a solution in which established and new technology are staggered in time.

The increasingly demanding communication requirements can be met by using “intelligent” field devices (scales, analysis devices, smart transmitters) in which partially configurable, partially parameterizable information processing provides better quality measurement signals within the devices and relieves the burden on the following signal process in the controllers of the process control system. Unlike with the analog standard signal (4 – 20 mA), with digital signal transfer it is possible to transfer higher resolution signals and verify the correctness of transferred data. As a general rule, digital transfer occurs with no loss of precision. If we wanted to transfer the additionally available status signals conventionally, the immense wiring effort that is already necessary today would reach unrealistic proportions. In a press release from

December 2016, NAMUR (the User Association of Automation Technology in Process Industries) also emphasizes once again that the transition to fieldbus systems will be the only opportunity to face this problem.

## **Requirements on an Ethernet-Based Process Fieldbus**

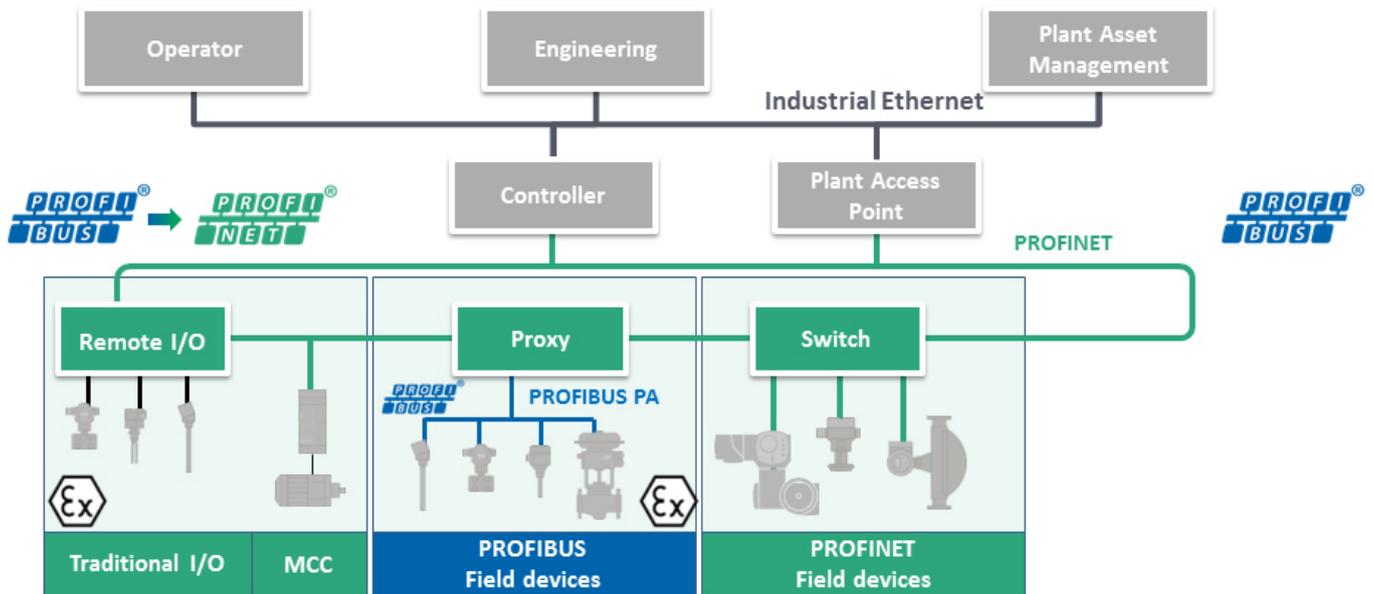
Users in the process industry have very specific ideas about what fieldbus systems must achieve. One of the basic requirements that was already discussed at the 2012 NAMUR Annual General Meeting is a “plug and play” concept for field devices. The basic idea is to make field device replacement semi-automatic. The installation location must be assigned manually to the new device, but the rest should occur automatically.

However, process automation still places many additional requirements on automation solutions. The plants are complex and often constructed of multiple sub-systems; they are large and usually extensive and have a lifespan of 15 to 40 years. The production processes must run fault-free and without any interruptions (24 hours a day, 365 days a year), sometimes over several years. This requires a flexible communication topology, robust connection technology, and redundancy concepts for critical functions. Another special requirement of the process industry (including chemical, petrochemical, oil & gas) is operation in potentially explosive areas.

Modifications and extensions are frequently made throughout the lifecycle of the plant, and the configuration of the automation changes correspondingly. The communication protocols used in the automation must meet these requirements.

## **PROFINET for the Process Industry**

PROFINET can be used in process technology plants in the short term. The corresponding functions and products are already available or have been announced. PROFINET provides special functions for the requirements of process automation. Scalable redundancy solutions corresponding to the automation requirements that are made and changing the configuration at run time are new elementary functions that will find their way into the automation components. Lower-level systems can be integrated seamlessly into the automation system. This provides investment protection for existing plants and instrumentation, e.g. with PROFIBUS PA.



The topology for PROFINET in process automation provides flexible options that allow connection directly to PROFINET for devices such as remote I/O or motor management system (image left), permits connection of PROFINET devices via a switch without the need for Ex protection and optionally with power supply via PoE (image right), or ensures the connection of unchanged PROFIBUS PA segments via a proxy (image center).

PROFIBUS PA is the proven fieldbus from PI (PROFIBUS & PROFINET International) for the process industry. It allows extended cabling, explosion protection, and digital integration of the field instrumentation into control and asset management systems and power supply to the field devices through the bus via the “Manchester-Encoded Bus Powered” (MBP) physical interface according to IEC 61158-2.

Segments of networked PA field devices (devices with an implemented PA profile) can be connected via coupling components (link, coupler, proxy) to PROFIBUS DP or PROFINET. Thus PROFIBUS PA remains the future-proof key technology for the process industry with guaranteed future compliance protection.

## PROFINET: Proven in Practice in Industrial Applications

PROFINET is already an established industry standard and is used in the so-called hybrid industries in addition to factory automation. Filling plants or mixing applications can already be automated with PROFINET without difficulty. Frequency converters, automation systems, and decentralized peripherals with Ethernet derivatives are available. The advantages arise over the entire lifecycle of a plant.

## New Products - August 2017

by Carl Henning - Wednesday, August 02, 2017

<http://profinews.com/2017/08/product-news-august-2017/>

There are nine new products to announce this month: PROFIBUS fiber optic repeater & new PROFINET cable from Belden; BEx-Solution offers a PROFINET I/O product for hazardous environments; Laumas has weight transmitters with PROFINET; Phoenix Contact introduces new PROFINET connectors; SICK presents an IO-Link flow sensor; Tolomatic announces an integrated servo motor and drive with PROFINET; and Vivace offers two PROFIBUS PA products.

*Click a headline below for details*

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### [Belden PROFIBUS Fiber Optic Repeater](#)



Belden Inc. has released a new version of its PROFIBUS fiber optic repeater. The OZD Profi 12M G22 allows PROFIBUS networks to communicate over longer distances through fast and reliable fiber optic signals, while also guaranteeing signal reliability through integrated redundancy technology.

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### [Belden PROFINET Cable](#)



Belden, Inc. has released its new DataTuff Cat6A PROFINET cables, designed to support the growing demand for high-volume data transfer from the factory floor. These cables transmit data up to 10Gb/s and provide the reliable, ruggedized and flexible connections required in environments built for the Industrial Internet of Things (IIoT).

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### [Remote I/O System - In Ex-Area](#)



BEx-Solution is the world's first

manufacturer

presenting a decentralized compact and explosion proof Remote IO System with PROFINET for hazardous area zone 1/21. During development, special attention was paid on, robustness, multifunctionality and plug & play. 32 intrinsically safe channels distributed to eight digital and analogue inputs and outputs provide direct connection of sensors and actuators from zone 0/20. The metal housing and the special potting technology ensure safe operation under extreme ambient conditions.

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### [Laumas PROFINET IO series Multi-channel Weight Transmitters](#)



The transmitters represent the innovation of a product already at the forefront as the TLB by introducing some important new features and improvements; the new enclosure provides a greater flexibility of use than the TLB series and can be installed on the front or back panel depending on the application requirements.

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### [Robust Power Connectors for PROFINET Applications](#)



The new connectors of the push-pull Advance series from Phoenix Contact safely and reliably transmit

power up to 16 A/24 V. The connection principle of the one-piece zinc die-cast housing corresponds with the push-pull data connector. This means that the IP65/IP67 connectors are particularly suitable for uniform Profinet cabling in an industrial environment. The integrated locking system offers additional safety, by reliably preventing the accidental release of connectors. The connectors are available in two versions for cable diameters from 6.5 mm to 9.5 mm as well as from 9 mm to 13 mm.

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### [SICK IO-Link Flow Sensor](#)



The new non-contact DOSIC® ultrasonic flow sensor is used to detect the flow volume of conductive and non-conductive liquids. With its measurement channel and stainless-steel housing, the ultrasonic flowmeter is suitable for measuring tasks in hygienic and highly demanding environments.

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### [Tolomatic Integrated Servo Motor and Drive Now with PROFINET](#)



The Tolomatic ACSI integrated servo/motor/controller is now available with PROFINET Industrial Ethernet protocol, allowing engineers to design easy-to-use and cost-effective electric actuator solutions for single-axis applications. The integrated package is ideal for replacing pneumatic cylinders and automating any simple axis of motion with Siemens or other PROFINET enabled PLCs.

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### [Vivace VRP10-O: Profibus PA Fiber Optic Repeater](#)



VRP10-O was designed to be used in Profibus PA networks, allowing that Profibus PA (H1, 31.25 kbits/s) electrical interfaces are converted into optical interfaces and vice versa. This allows half-duplex communication at distances up to 4 km with EMI immunity benefits. It has feature of a Profibus PA repeater and supports 31.25 kbits/s.

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### [Vivace VRI10-P: Profibus PA Remote Indicator](#)



VRI10-P is a remote indicator for Profibus PA networks. It is designed to display up to 10 indication values on LCD display from devices installed on the same Profibus PA segment. The indicator is powered by a 9-32 Vdc voltage and uses the Profibus PA communication protocol for configuration and monitoring of information on the LCD display.

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## Regional News - August 2017

by Carl Henning - Wednesday, August 02, 2017

<http://profinews.com/2017/08/regional-news-august-2017/>

*In Bangkok, a PI seminar drew big crowds, next up is Vietnam. In the USA, there is a series of workshops to “add PROFINET to your device in three hours” coming up in October. Australia looks back on their 2016 Automation Innovation Summit.*

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### South East Asia

PI SEA concluded another successful seminar in Bangkok, Thailand. The event was attended by more than 85 users and 6 corporate members of the association. Watch for our next seminar in HCMC Vietnam!

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### USA

Phoenix Contact and Siemens will host five workshops throughout the USA to show how to add PROFINET to a device using their TPS-1 chip.

- Waltham, MA - October 3, 2017
- Ann Arbor, MI - October 5, 2017
- San Jose, CA - October 9, 2017
- Houston, TX - October 11, 2017
- Atlanta, GA - October 13, 2017

[Get the brochure here.](#)

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### Australia

Twelve months ago, *Innovation by Inspiration*, the dream of event conveners PROFIBUS & PROFINET Australia (PAA), was achieved thanks to the curation of topics and the high quality of speakers. And *Innovation by Collaboration*, the practical reality for those inspired to implement the way forward that networked technology allows, was given a big leg-up by the human networks established that day.

PAA is heartened to hear that more than twelve months later, those human networks remain connected and in active use.

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## Making a “case” for IO-Link [App Story]

by Carl Henning - Wednesday, August 02, 2017

<http://profinews.com/2017/08/making-a-case-for-io-link/>

IO-Link is a revolutionary, cost-effective sensor and actuator standard that can today enhance the flexibility, capabilities and productivity of packaging machines both new and already in use with little extra burden on operators or maintenance personnel. In fact, it makes their jobs easier.



These two IO-Link enabled laser sensors, at center of photo with yellow cables attached, increase the accuracy of analog distance measurements in a case loading magazine on this Edson case packer.

IO-Link is based on the first international standard for IO technology IEC 61131-9. This standard has the enthusiastic support of the major automation companies from sensor and actuator manufacturers to controls suppliers. This means that new IO-Link enabled sensors and actuators are coming to market rapidly, and that the supplier community is supporting original equipment manufacturers (OEMs) as they incorporate the standard into their packaging machines. The following three examples of applications on Edson (edson.com) case packers illustrate the practicalities of IO-Link.

### How IO-Link Helps Case Packers on the Line

For many years, Edson utilized radio-frequency identification (RFID) tags on change parts. Machine-

mounted tag readers verified the correct change part was in position for an upcoming SKU. The case packers would not run with a wrong part installed. Each RFID reader was hardwired back to an I/O card and was capped at less than 255 read only RFID tags due to limited panel space and I/O availability. On occasion, a customer wanted to add change parts for a new SKU. The problem, in the past, was that this entailed additional sensors, multiple wires per sensor and an increase of I/O cards that had to be incorporated into an already tightly packed control cabinet. Expanding the system posed issues.



RFID tags are used to identify change parts for each SKU run on this Edson case packer. IO-Link makes it easier to add new read/write heads as well as add data rich capabilities. The RFID read/write head is shown here.

Now, with IO-Link, a single Standard Shielded sensor cable runs to an enabled RFID reader. Each reader can handle more than 255 tags and can write to the tags, as well. The amount of data transfer is exponentially higher than before. No additional cabinet space is required to add readers because IO-Link components connect via Standard Shielded sensor cable to an IO-Link Master, a plug and play IP67 rated adapter that can be mounted to the machine. The IO-Link cable can be up to 20 meters long, so distance between component and IO-Link Master isn't typically a hurdle.

The Edson case packer's controller now tracks the cycles of each change part for preventive maintenance purposes. It is fast, simple and cost effective to add readers to an existing machine. If a reader fails, the controller senses the failure, identifies the exact reader and alerts maintenance personnel to the location through the human machine interface (HMI). Diagnostics are a big part of IO-Link. Furthermore, maintenance personnel only need to physically install the sensor. There is no manual configuration required. This is one of the best features of IO-Link – automatic configuration of components via PLC.

Automatic configuration is true of all IO-Link sensors. Customers like the fact that sensor settings are protected through the HMI. An inadvertent or incorrect change to sensor settings by personnel is a thing of the past.

Edson utilizes IO-Link enabled laser sensors located in a case loading magazine to give analog feedback on the exact location of the next case to be picked up. Accuracy is within + .04 inches (1mm). This level of accuracy, which was not cost effectively achievable before, leads to more precise case handling and the elimination of jams due to inaccurate distance readings. These sensors can also detect slope variation in a stack of cases. Large variation identifies cases that are out of specification. The system alerts operators before a jam occurs.

In addition, Edson applies IO-Link enabled photo-eye sensors in locations on a case packer particularly susceptible to dust build up, i.e. sensors facing vertically and/or on machines destined for high particle environments, such as paper packaging plants. With IO-Link, operators receive information on the exact location of any photo-eye lens that is becoming covered in dust. This information helps keep the machine operating at peak performance and ultimately means less time spent by maintenance personnel trying to diagnose the cause of a stoppage.

There are practical benefits of IO-Link, not only for case packers but every packaging machine:

- Smart changeover on the fly – replace the sensor and the controller does the rest
- Self-diagnostics alerts operators to a problem and pinpoints the sensor and the issue for faster troubleshooting
- A wider variety of sensors for greater capabilities than before
- No added burden for the operator; in fact, IO-Link enables operators to keep the machines at peak uptime
- Personnel cannot inadvertently change a sensor setting and cause an operational problem
- Faster installation of new machines with less wiring
- Practical and cost effective to upgrade to IO-Link sensors in many cases
- Decrease in hardware when communicating via Ethernet
- IO-Link and non-IO-Link sensors can exist on the same machine on the same network so OEMs can drill down for the optimum mix for price and performance.

## **A Look Ahead to the Industrial Internet of Things and IO-Link**

Visualize a future where a control center, either in a plant or at a corporate facility responsible for many operations, is staffed by highly trained personnel. These control centers will have web-based access to every production machine down to the sensor and actuator level. Sophisticated algorithms – perhaps artificial intelligence – monitor machine condition. Information on such conditions as dust on a photo-eye lens, a stuck actuator or a servo motor heating up is immediately available to control center staff. Alerts in the form of text messages are dispatched automatically to the mobile device of an on-call maintenance technician, pinpointing the exact problem and location. Control room staff is available with informational backup, including vendor information and availability of onsite replacement parts. This scenario is possible today and will undoubtedly be common tomorrow. A key enabling technology of this capability is IO-Link with sensors and actuators individually accessible through Internet-based communications – the very foundation of the Industrial Internet of Things.

Authors:

Barry Sonny is a veteran electrical control designer for industrial automation equipment with Edson Packaging Machinery. He has implemented numerous IO-Link Master and IO-Link enabled devices for case packing machinery.

John Whiting is an experienced controls programmer at Edson Packaging Machinery with designing, testing, building and servicing skills. He has extensive knowledge in the development of new automation equipment and automation upgrades for existing equipment.

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## The PROFINET Community Comes Together for Testing

by Carl Henning - Wednesday, August 02, 2017

<http://profinews.com/2017/08/the-profinet-community-comes-together-for-testing/>

On July 12 and 13, 2017, the PROFINET community met at Festo AG & Co. KG in Esslingen for a PROFINET Plugfest, an event providing participants with the perfect setting for practice-based testing and knowledge sharing. Some 70 developers and suppliers of basic technologies, devices, and systems representing a wide range of sectors used this opportunity to simply and directly test their latest developments in a diverse environment, including under stress conditions. Experienced specialists from the field of end-user support directed application scenarios – related to PROFIenergy, for instance – allowing for the testing of not only basic communication but also of the application view that is so vital to market success. The tests also focused on PROFIsafe, PROFIdrive, net load, and asset management.



Matthias Prinzen, of Festo, explains his involvement in the Plugfest: “Festo sees PROFINET as one of the world’s leading communication systems in the field level. Our pneumatic and electric actuators use PROFINET as a communication interface. Plugfests serve as a platform for verifying new implementations and for testing the new features of the PROFIenergy profile. Energy management is becoming increasingly important to customers – for example, with our energy efficiency module with PROFINET and PROFIenergy.”

Testing was carried out in a proven fashion in various systems ranging from small groups up to larger shared networks. Participants particularly appreciated the open exchange of experience among specification experts, device developers, and certification bodies. Joachim Probst, of Endress & Hauser

Flowtec AG, confirms this point: “We have the great advantage here of connecting our devices to different control systems. This enables us to ensure that all implemented features are supported by all PROFINET controllers on the market – before making them available to customers.”

Plugfests have become an established event in Germany, the United States, and China and will be held in Germany again next year.

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## IODDfinder Contains Nearly all IO-Link Devices

by Carl Henning - Wednesday, August 02, 2017

<http://profinews.com/2017/08/ioddfinder-contains-almost-all-io-link-devices/>

*In just six months after its introduction, more than 80% of all IO-Link devices on the market can be found in the IODDfinder, the central database for IO-device descriptions.*

The service launched by the IO-Link community at the start of this year was received very well by manufacturing companies and users alike and will contribute decisively towards the further spread of IO-Link.

The IODDfinder portal meets the desire of users of IO-Link technology for a central access point for IODDs of all IO-Link devices common in the market. This consistent data pool is available 24/7 and allows not only interested parties access to this database but also facilitates the direct connection of engineering and parameterization tools. Relevant software tools are given access via the Internet to this manufacturer-neutral data pool, which guarantees the user automatic access to all operationally-important description files of its IO-Link devices.

So far, more than 30 manufacturers of IO-Link devices are participating in the data platform and have already stored about 1,900 IODDs. With this amount of IODDs, more than 3,900 different IO-Link devices can be parameterized. On the consumer side, the platform was able to deal with roughly 2,500 call-ups per day in the first half of the year.

These figures demonstrate in an impressive way how valuable the new Internet service is for the IO-Link world. The IODDfinder can be reached either from <https://ioddfinder.io-link.com> the [IO-Link homepage](#) or directly via the following link: <https://ioddfinder.io-link.com>.

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## Flexible Muffler Production with IO-Link [App Story]

by Carl Henning - Wednesday, August 02, 2017

<http://profinews.com/2017/08/flexible-silencer-production-with-io-link/>

*The automation of a production line for exhaust systems enables Turck to demonstrate the flexibility of its BL20 multiprotocol gateway in conjunction with the IO-Link-capable TBIL hubs.*

The creation of a new production line for exhaust systems, or more specifically silencers / mufflers, presents automation engineers with a wide range of different challenges: Firstly, the harsh industrial environment with the presence of welding sparks and electromagnetic interference, and secondly, the production requirement to bring together different individual products harmoniously to form a complete solution. In order to meet these requirements, one of the leading manufacturers of exhaust systems chose Turck's BL20 modular I/O system in order to provide a highly flexible I/O solution. The customer fitted out a completely new factory in Turkey with Turck's multi-protocol gateways, which can operate in Profinet, and other networks. The production lines in this factory make large mufflers for trucks and buses. The system integrator Teknodrom Robotik ve Otomasyon was responsible for the installation and integration of the entire automation solution. The company has a great deal of experience in the automation of systems in harsh environments, such as those found in the automotive industry.

Teknodrom spoke to Turck about the sensor and I/O requirements for the new production line already in the design phase. The multi-protocol gateways, which speak the three Ethernet protocols and feature the necessary I/O slices, enable the BL20 system to bring different types of signals to the controller and also link different valve blocks of the production line. The end customer particularly appreciates the simplicity of the BL20 modular system, as well as the easy the maintenance and diagnostics it allows.

### **IO-Link Ensures Efficient Production**

The user benefits enormously from the flexibility that IO-Link provides for the requirements of this system. For an increasing number of users, this communication standard has become an attractive way of providing transparent access from the controller to the sensor.



In

this project, Teknodrom Robotik ve Otomasyon was able to fully utilize Turck's complete IO-Link portfolio in order to put together a tailored I/O solution for its customer. Turck's BL20-4IOL gateways with IO-Link master modules and the IO-Link-capable IP67-TBIL I/O hubs bring up to 16 switching signals from the field to the control cabinet via a single four-wire cable. The TBIL functions as an IO-Link slave, bringing 16 binary signals to the IO-Link master on the BL20 gateway. This not only considerably reduces the wiring effort required but also the possibility of wiring errors. Passive junctions with large multi-pole cables are often used as an alternative solution. However, as each wire of this type of cable has to be connected at the gateway or controller at its specific terminal, this solution is not only time consuming but also expensive. Finally, the considerable amount of documentation required makes the task more difficult.



The right Turck offering: With IO-Link, multiprotocol Ethernet and I/Os for a large number of inputs and outputs, the integrator was able to provide the customer with a tailored solution

Another benefit of IO-Link in the production line becomes apparent when different tools are changed: “The clamping devices for the products have to be changed frequently in the plant. The IO-Link modules for BL20 offer here a high level of flexibility. During the installation, we can quite simply adapt the BL20 system and add more signals or reduce them. With every additional expansion or upgrading of the plant we benefit from this flexibility,” says Selim Ça?atay, the control technician responsible at the system integrator. Besides the input signals, the actuator signals to the valve blocks also have to be transferred to the BL20 system via IO-Link. A single interface therefore collects all IP20 I/Os, the IP67 sensor signals from the field and the IP67 actuator signals to the valve blocks. The Teknodrom engineers praised this feature in particular: “The ability to connect several different modules (valve blocks and block I/O modules) from a single point is a major benefit of the Turck I/O solution.”

## Efficiency Through Decentralized IP67 I/Os

Production lines for MIG (metal inert gas) welding require an extremely robust connection and sensor technology due to the high level of electromagnetic pollution. In view of the fact that errors in the connection technology can be avoided best of all by reducing the number of connection lines, a smart IO-Link solution is significantly simpler, faster and more economical to implement than multi-protocol cable systems. It also makes a major contribution to quality assurance. All signals are collected via Turck’s TBIL IP67 IO hubs and then forwarded to the BL20 system via a single four-wire line. The IO-Link master and multi-protocol gateway handle the additional communication with the controllers via Ethernet. Thanks to the digital IO-Link transmission, the user can save on the expense of shielded cables and other EMC measures. “Thanks to this compact and flexible solution with a good price / performance ratio, we believe we have found the best solution for the customer,” Selim Ça?atay explains the decision to choose BL20 with IO-Link as standard for the new muffler production.

*Author: Sinan Çakmakç? is business development manager at Turck in Turkey*

*Integrator: [www.teknodrom.com](http://www.teknodrom.com)*

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## Test your Knowledge: Ethernet Quiz

by Carl Henning - Wednesday, August 02, 2017

<http://profinews.com/2017/08/ethernet-quiz/>

After several PROFINET Quizzes, it was time to be more general and have an Ethernet Quiz. Of course, it has a PROFINET flavor to it.

1. Only one application protocol can exist on an Ethernet network. [TRUE](#) or [FALSE](#)?
2. Ethernet networks today must account for network collisions. [TRUE](#) or [FALSE](#)?
3. An Ethernet network requires TCP/IP to work. [TRUE](#) or [FALSE](#)?
4. Ethernet networks use the seven layers of the ISO/OSI reference model. [TRUE](#) or [FALSE](#)?

Perfect score? Congratulations! Miss a few? You might want to take the following webinar: [An Introduction to Ethernet for Control Engineers](#).

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## PROFINET and HMIs [Tech Tip]

by Carl Henning - Wednesday, August 02, 2017

<http://profinews.com/2017/08/profinet-and-hmi/>

There is often some confusion when engineers begin to use Human Machine Interfaces (HMIs) and PROFINET, so we will explain how HMIs are typically used in PROFINET systems and describe the types of HMIs and application protocols available.



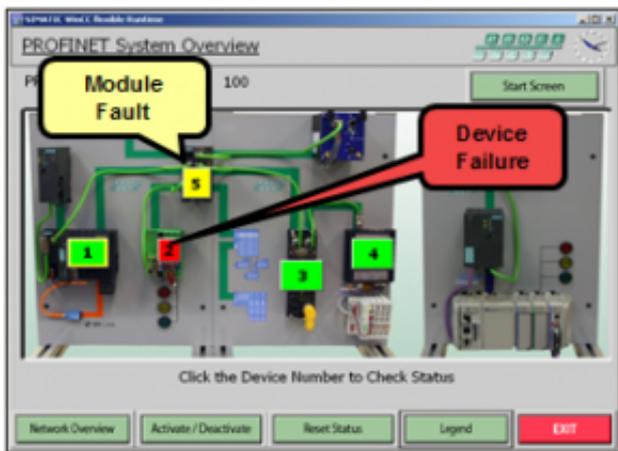
First off, let's start with a description of what an HMI is:

A Human Machine Interface (HMI) or sometimes called Operator Interface is a device used in automation environments which provides graphics-based visualization for both monitoring and control for a human operator to interface to a machine. Oftentimes, on PROFINET systems, this is a device connected to the network which usually communicates to a Programmable Logic Controller (PLC), Programmable Automation Controller (PAC), or Distributed Control System (DCS). An HMI can be used to read or write process information to these systems or to receive notifications and diagnostics / alarm messages in case a problem arises.

In modern systems, HMIs have become even more ubiquitous and can be implemented via an external node with a built in display usually ranging from 4" to 20" screen size (operator panel / interface), a PC with HMI software loaded, or even a mobile device such as a tablet or smartphone with a special HMI app. It should be noted that HMIs can be wired or wireless on PROFINET systems allowing mobile functionality. The advantage of a mobile device is that it can be right beside the operator at all times. Some PROFINET HMIs might even have an e-stop button built in (for instance as part of a PROFIsafe application) to stop the machine in case a safety issue occurs.

As the need for more information arises and the use of analytics and machine tracking are employed, HMIs are as important as ever and their role is even expanding. HMIs may not just be monitoring a device or a single machine now; they might be monitoring the entire process or multiple machines in conjunction with a Supervisory Control And Data Acquisition system – SCADA. We even see HMIs embedded in PLCs, drives, network components, and other devices to offer easy device management and process monitoring. Also, cloud based monitoring systems with analytics and diagnostic reporting on the overall process can be found.

Many questions may arise when using HMIs on a PROFINET system such as “What protocol(s) are the HMIs typically using on a PROFINET system?”, “How can I use



**PROFINET diagnostics overview displayed on a HMI (Human Machine Interface)**

design HMIs into a system?”

them in my applications?”, and “How can you best

The good news is that there is no need to worry. HMIs work seamlessly on PROFINET systems because PROFINET is an open network, so any Ethernet based protocol can be used on your HMIs whether it’s PROFINET real time (RT) or TCP/IP, but there may be reasons to choose one type or another depending on your application requirements. And all application scenarios are well covered by vendors today.

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