

# PROFINEWS

PROFIBUS & PROFINET news from around the world

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## PI Community Communications

by Karsten Schneider - Friday, March 04, 2016

<http://profinews.com/2016/03/pi-community-communications/>

*PI Chairman Karsten Schneider's observations on the importance of communications - not just in bits and bytes, but person-to-person and organization-to-organization*



The huge success of PI technologies is based on communication. Of course, the technology itself shared in this, too. Indeed, the quality and widespread global use of PI technologies would never have been possible if the PROFIBUS developers had not had an outstanding character trait - the absolute determination to communicate with one another. Only in this way could there be unanimous consent for a sustainable, reliable, vendor-neutral solution in the form of PROFIBUS and PROFINET.

The path to this was, and is still, not always easy. When it comes to details, in particular, it is not out of the ordinary for intense discussions to occur. But the effort always pays off. Members of PI are collaborating closely in over 40 working groups. But we also pay close attention to our users' needs. It is therefore no wonder that many initiatives from user groups have resulted in development of successful technology, such as PROFIsafe and PROFIenergy.

In recent years we have intensified our efforts to make contact with other organizations in order to serve our users even more fully. The FDI project is a prime example of how users, manufacturers, and user organizations can cooperate. The OPC Foundation and PI have also recognized each other as cooperation partners for years. This cooperation is now becoming even more intense in the context of Industrie 4.0. Industrie 4.0 also set the stage for the latest cooperation between CLPA (CC-Link Partner Association) and PI.

You can read about the technological developments emerging from these partnerships in an upcoming PROFINETS. And you can see how these partnerships are being put into practice at Hanover Fair and other events. We invite you to plan to visit us in Hall 9, Booth 68 at Hanover Fair to create new communication networks.

*Karsten Schneider  
PI Chairman*

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*Editor's note: Karsten emphasizes the importance of the developers of the PI communication*

*technologies. This issue of PROFINETS carries that importance to the developers of products that use the technologies with stories from the embedded world trade-show, about developer classes, and with the PROFINET Commander developer tool.*

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# The Continuing, Critical Role of Industrial Ethernet

by Michael Bowne - Friday, March 04, 2016

<http://profinews.com/2016/03/the-continuing-critical-role-of-industrial-ethernet/>

## Paradigm Shift vs. Opportunity Shift

The industrial move from analog signals to digital fieldbuses was nothing short of a paradigm shift. Instead of running 25 individual wires, with digital fieldbuses, users could run a single cable and truly create a network. Instead of a single scalar value in the range of 4–20 mA, users could now have an actual value—plus units and status information.

If the move from analog to digital fieldbus was a *paradigm shift*, the move from fieldbus to industrial Ethernet presented an *opportunity shift* by enabling functions that were not previously possible.

## New Use Cases

Like digital fieldbus, industrial Ethernet is about creating an automation network; the difference is that industrial Ethernet expands the network beyond the realm of control engineers. To better understand this difference, consider safety applications. In the past, a separate, dedicated safety system of contactors and relays was required in addition to the existing automation network. Today, all those contactors can be connected to industrial Ethernet, thereby eliminating the extra wiring. Users can also replace many relays with a safety logic controller. And the differences don't stop there.

Because Ethernet is a commercial technology, industrial Ethernet is an infrastructure that can be used by other devices, thereby making the transmission of large data volumes feasible. Of the industrial Ethernet options on the market, Profinet is currently the only standard that supports the complete real-time spectrum—from hard real-time requirements in high-performance machines (with the necessary openness for IP communication) to the transmission of large data quantities in real time within automation systems and higher-level IT systems.

## Hybrid Industries

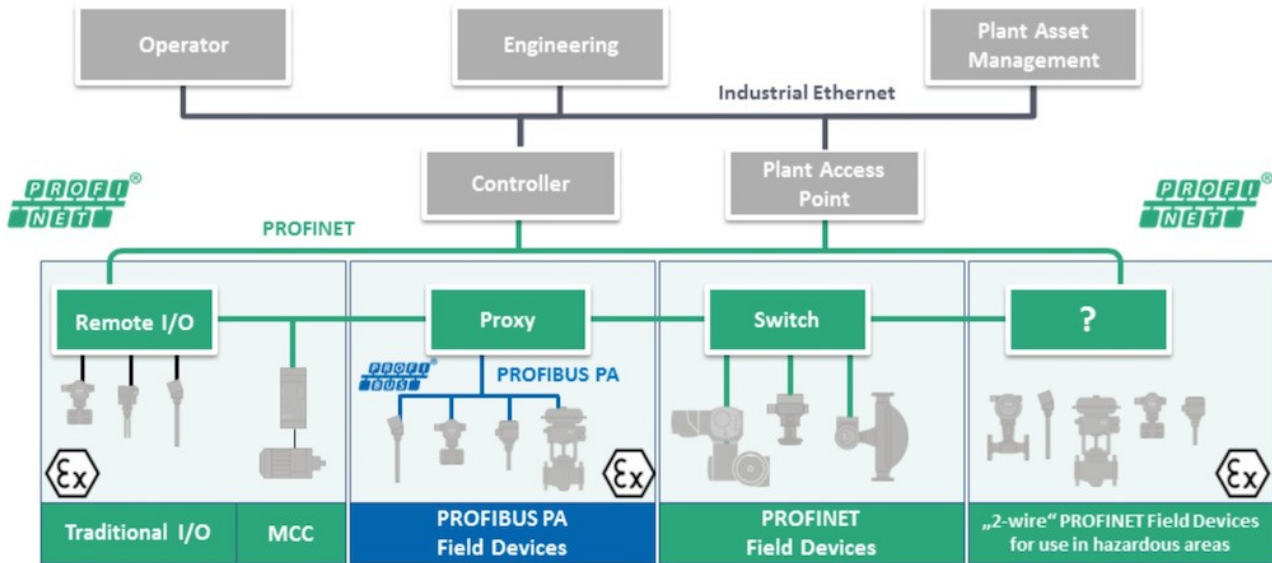
Proof of industrial Ethernet's capabilities in industry can be seen in hybrid industry applications. Here, adoption of industrial Ethernet is being driven by the introduction of ever more powerful programmable logic controllers (PLCs), which can replace distributed control systems (DCSs) in some instances. Coupled with the fact that not all of these installations require intrinsic safety (which can be provided by Profibus PA), Ethernet is rapidly growing in popularity as a network backbone.



These hybrid industry installations often lend themselves to the development of “islands of automation,” with each machine performing a specific task. Profinet performs well here, particularly because of the high demand for determinism. In addition, Profinet can be used to link these islands of automation for horizontal integration and provide the data for vertical integration into the enterprise.

## **Continuous Process Applications**

Even in strict continuous process applications where intrinsic safety is required, Ethernet is making inroads. These systems are typically complex in structure, consisting of different subsystems with numerous devices and differing topologies, manufacturers and technologies. Plant owners and operators urgently want this complexity to be harmonized and the data and information systems to be fully integrated and easier to handle. Using an Ethernet-based protocol solves many of these problems by allowing rich metadata to be transferred seamlessly.



In the case of hazardous areas in the continuous processing industries, an example of the industrial Ethernet inroads being made here can be seen in the handling of this data via standardized proxies from Profibus PA to Profinet. Many expect that, in the near future, an intrinsically safe two-wire Ethernet physical layer will become available, thereby removing the need for such proxies. At that point, data transparency will be maximized.

## Industrial Internet vs. Industrial Ethernet

As we've stated before: **“If Industrial Internet is the ‘what,’ then industrial Ethernet is the ‘how.’”** That statement still rings true today. By betting on Ethernet-based protocols, we can ensure connectivity—even if we don't know exactly what the future may hold.

*This article appeared originally in [Automation World](#) magazine.*

## **PI at embedded world**

by **Carl Henning - Friday, March 04, 2016**

<http://profinews.com/2016/03/pi-at-embedded-world/>

Each year the embedded world Exhibition & Conference in Nuremberg offers the embedded community the opportunity to obtain information about new products and innovations, enter into an exchange, and to develop and maintain valuable contacts. This year's exhibition was the largest ever with 939 exhibitors from 38 countries.

And PROFIBUS & PROFINET International (PI) was a part of the show.

At the PI booth, 13 member companies presented their products and services around PROFINET. The highlight was again the impressive PROFINET Factory Automation Wall all with numerous PROFINET products. The co-exhibitors Innovasic, Molex, Phoenix Contact, Renesas, and Siemens gave information about how to implement PROFINET and what kind of support can be given during the development.

The advent of Industrie 4.0 increases the technical demands on both existing and future products. There are solutions that provide a high degree of integration. Hence Industrie 4.0 was also the main theme of the booth at embedded world 2016 and PI had proven once again that PROFINET is the backbone of Industrie 4.0!

Here are some photos from the PI booth:

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## PI North America Announces Developer Training

by Michael Bowne - Friday, March 04, 2016

<http://profinews.com/2016/03/pi-north-america-announces-developer-training/>

PROFINET Developer Training is designed to help vendors weigh the factors that allow them to create the product that their end-user customers need. Each workshop is exclusive and confidential, with only one company per class. The training is 'solution neutral', meaning it is tailored to whichever method the vendor chooses to implement PROFINET in their product. This includes ASICs, FPGAs, modules, or software stacks. Every PROFINET development project is different, so each class is tailored to meet the needs of the student(s). However, there are some common elements to the classes. For example:

- How end-users view and work with PROFINET devices
- How to turn marketing requirements into PROFINET product features
- How data is modeled in PROFINET



“PROFINET has reached an inflection point in North America,” says Michael Bowne, Executive Director of PI North America. “With demand from end-users at an all time high, US-based automation vendors are scrambling to add PROFINET to their devices. They want to be able to play in this marketplace.”

Torsten Paulsen, Manager of the PROFI Interface Center, adds, “We’re here to address that need. That’s why we are prepared to teach the class either at our lab in Johnson City, or onsite at a location of the vendor’s choosing.”

Students should have successfully completed the Certified PROFINET Network Engineer course, or have a strong networking background and experience with TCP/IP stacks. Prior experience with industrial distributed I/O systems and Ethernet traffic analysis with Wireshark is highly recommended.

**Click here for more information on [PROFINET Developer Training](#)**

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## Training and Events

by Carl Henning - Friday, March 04, 2016

<http://profinews.com/2016/03/training-and-events-2/>

PI North America sponsors a range of classes: free one-day training classes, PROFIBUS Certified Network Engineer classes, PROFINET Certified Network Engineer classes, and the newly created PROFINET Developer Classes. Globally, there is a five-city series in France featuring PROFIBUS, PROFINET, and wireless PROFINET and in Germany a plugfest.

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PROFIBUS and PROFINET Certified Network Engineer classes still have a few remaining seats available, including PROFINET classes in Detroit and Seattle. See [the full list](#).

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The newly available PROFINET Developer Classes are listed [here](#). And see the article in this issue, [PI North America Announces Developer Training](#).

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Certified PI Competence Center and Training Center, Agilicom is presenting a series of



For training &  
events around  
the globe  
click here

free technical seminars including PROFIBUS, PROFINET, wireless, and remote diagnostics. These will be held in Strasbourg, Lille, Lyon, Paris, and Rennes. For details [download the invitation](#).

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Of special interest to PI members is the upcoming plugfest in Germany. PI invites all developers from device, controller, and tool manufacturing companies to the upcoming PROFINET Plugfest on June 1 and 2 in Erlangen. This plugfest is kindly hosted by Siemens.

The aim is to test the current status of the different controller and device implementations with focus on communication and application behavior. Focus topics are PROFINET, PROFINET IRT, PROFIdrive (also PROFIdrive on PROFIsafe) and ENCODER profile. The test is partitioned into different feature related test stations with smaller-sized networks which are finally hooked up to form a huge joint network. This plugfest offers a unique opportunity to all participating companies to easily test their device interoperability in a multi-vendor surrounding and for practical exchange of experience.

Any PI/PNO members are very welcome to participate in this project, to share their experiences with the community as well as to push their own device development.

Location: Siemens AG, Frauenacherstr. 80, 91056 Erlangen-Büchenbach (Germany)

Date: June 1 & 2, 2016

Schedule: Plugfest 10 am to 4 pm; set-up from 9 am

Please note that the maximum number of participants is limited to 60 persons and therefore no more than 2-3 persons per tested device can be admitted. Only PI members are allowed to register for the plugfest. Further details and a link to registration are [here](#).

**North American members** are welcome to attend, but scheduling of a plugfest in North America is also under consideration. Contact [Carl Henning](#) to be added to the North American plugfest mailing list.

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## Take Command of your Network

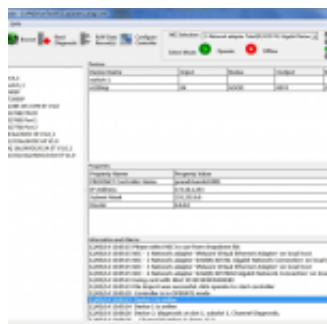
by Michael Bowne - Friday, March 04, 2016

<http://profinews.com/2016/03/take-command-of-your-network/>

PROFINET Commander provides value to a variety of users interested in interacting with PROFINET devices. For automation product developers, it provides the ability to quickly test a new device or system under development. Meanwhile vendor salespeople can demonstrate a product without extra hardware. End-user engineers can configure a device to check before employing in production. End-user maintenance persons can setup a device name or get diagnostics via PROFINET.

The main features are:

- I/O controller and I/O checking
- Diagnostics
- Reading and writing PROFINET data records
- DCP browser



### I/O Controller

The I/O controller in PROFINET Commander can be used to communicate to an I/O device or network consisting of multiple devices. This is a vendor independent function which will work with any PROFINET RT device. The user can start and stop the device(s), set I/O points, and get diagnostic alarms.

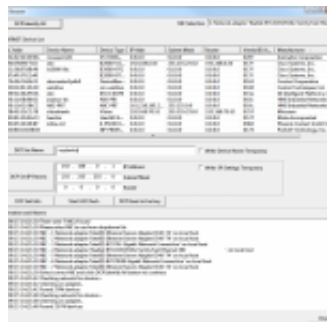
### Diagnostics

The Diagnostics functions can be used to troubleshoot a device in the event of a real time diagnostic alarm. There are both alarm functions and multiple ways to read the diagnostics out of the device directly in the event of a diagnostic condition. Diagnostics can also be read acyclically by using data records.

### Reading and Writing

PROFINET read and write functions can be used for parameterization or other device specific information. This allows you to read standard PROFINET records like AR (Application Relation) information, I&M (Identification & Maintenance) information for maintenance, port information,

diagnostics and more. There is even the ability to write standard or vendor specific parameters to a device directly.



### **DCP Browser**

The latest version of the software provides a DCP (Discovery and Configuration Protocol) browser that lets you scan the network for devices, setup device names and IP addresses, and get manufacturer information or a network inventory.

**Go To [PROFINETCommander.com](http://PROFINETCommander.com)**

## PROFIBUS PA - Saving Money from the Start

by Carl Henning - Friday, March 04, 2016

<http://profinews.com/2016/03/profibus-pa-saving-money-from-the-start/>

**Recently on a LinkedIn forum dealing with the process industry, someone asked the following question: "I am a new instrumentation engineer. How does 4 mA ... 20 mA technology work and why not 0 mA ... 20 mA?" What followed was an in-depth analysis of the origins and history of the technology, Ohm's law, and compressed air. Lost in the heat of the discussion, two people made almost the same comment: "We should leave that behind and just switch to fieldbus!"**

Journey back in time to the 1950s and 1960s: Three black and white television channels are a sought-after luxury. There are simple adjustment dials for both volume and brightness. The resolution is 30 lines—around 1280 pixels—with a refresh rate of 12.5 Hz. Electronics is finding its way into the process industry: Instead of compressed air, a thin two-wire cable is used for the power supply and instrument control. The resistance is high: Engineers must now carry a device with them all the time: the multimeter! The counterargument: "With compressed air, I can hear whether it is working if I pull out the hose." The planner says: "Now I have to switch everything to the new technology and cannot just create a carbon copy of the previous system." (The photocopier has already been invented, but has not yet been universally introduced.)

At this point, we will avoid repeating the advantages of digital communication using PROFIBUS PA or FOUNDATION fieldbus H1. As is also the case with conversion from compressed air to electrical signals, the benefits can be reaped when all of the tasks from planning and commissioning to operation and maintenance are also adapted.

The practical benefits come from the correct handling of the technology and how you take advantage of these benefits. The fieldbus already starts to pay for itself at commissioning time.

### **HART? PROFIBUS PA? FOUNDATION fieldbus H1? Or what?**

The fieldbus is essential for all those who are serious about the "Internet of Things" and Big Data. In this respect, the following instructions apply to all digital transmission systems, including HART and WirelessHART.

250 automation specialists attended the 2015 PI conference in Speyer. This conference is organized every two years by [PROFIBUS and PROFINET International](#). Practical demonstrations were performed as part of workshops, showing how a fieldbus ensures effective process management. The workshop on planning and explosion protection showed, using the example of PROFIBUS PA, how planning needs to be adjusted, so that the first "profit" from a higher level of efficiency and shorter project duration can be seen at commissioning time:

**Use typical variables, models, and templates!** For PROFIBUS, the application profile PA 3.02 describes a standardized template example independent of manufacturer and software revision for each instrument type, which governs the devices and control technology. In practical terms, this means:

configure the address, connect, and run. The PROFIBUS PA profile also handles device changes without any problems. The maintenance engineer no longer has to worry about compatibility between device and control technology. The new instrument is automatically compatible: configure the address, replace the device, connect, and run.

According to Pareto, approximately 80% of the loops can be efficiently planned and tested in advance and the parameters optimized. The purchasing department orders the devices with the optimized parameters, which are configured by the manufacturer in the factory. The majority of the measurements should be implemented in this way. This also minimizes issues of DCS integration.

**Take Advantage of the Added Value of Devices!** Measuring instruments with multiple variables eliminate the need for additional compensation calculations or supply values for energy, density, and mass in one telegram. The manufacturers will be happy to show how it works and how digital technology helps increase accuracy to the point where it can be utilized for billing purposes.

**Plan the Installation in Advance!** Trunk-and-spur topology is the industry standard for installation. This topology is simple to understand and corresponds conceptually to the old terminal board. Each field device is individually accessible. The limits for geographic dimensions or the device count are checked in advance taking cable length and voltage drop into consideration, e.g., with the [free Segment Checker tool](#).

Verification of intrinsic safety in accordance with FISCO can be carried out at the same time using the documentation without additional costs. With the high-power trunk, cables over 1000 m long present no problems, even in hazardous areas up to Zone 0/Div. 1.

**Check and define the shielding and grounding concept as part of planning activities.** There are no standards for this. A specialist develops a suitable concept depending on conditions, such as the electrical installation, the geographic conditions, and so on. Don't skip this step. It is crucial to establishing reliable communication.

**Decide on the need for lightning protection at an early stage.** It cannot be retrofitted in the control cabinet or in the field junction box. Modern lightning protection is self-monitoring and can automatically report to the plant asset management system when it ceases to function. This is real savings for the maintenance team, whose equipment can be affected by power surges or lightning strikes.

**Special care should be taken with shielding.** This is new and different! Therefore, the installation personnel should be informed about the small differences in a one-day training session. Otherwise, a fieldbus device is connected just as easily as a device with a 4 mA ... 20 mA connection.

### **Time saved, satisfaction secured**

Well-thought-out planning will be rewarded with a significant reduction in commissioning time—especially when compared with conventional 4 mA ... 20 mA technology. A reduction of several weeks is possible for larger systems, for example, one with 1200 instruments. The production management will certainly be pleased about this. With automatically updating documentation in the control system, many of the corrections required in the documentation that would otherwise be performed manually are no longer necessary. A technical white paper from Pepperl+Fuchs discusses best operating practices for commissioning of fieldbus systems made efficient through diagnostics. It illustrates the



potential efficiency and time saving in the context of a case study. The [white paper](#) is free to download.

One way or another: The next plant after this one should be planned from carbon copies or photocopies of projects planned using digital technology, right? No, of course not. Your best bet is to create a copy of your project in the Cloud and access the data from your smartphone. Just like you access the data in your field device—made possible by your fieldbus. You no longer take a compact transistor radio to work with you, do you?

Andreas Hennecke, Pepperl+Fuchs

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## IO-Link: Did You Know?

by Carl Henning - Friday, March 04, 2016

<http://profinews.com/2016/03/io-link-did-you-know-12/>

### **Did you know that IO-Link drastically reduces the interfaces needed?**

Modern automation systems contain a variety of simple and more complex sensors and actuators from different manufacturers that are linked to controllers using different physical interfaces for digital, analog, and serial data. With this variety of physical interfaces on the sensor/actuator side and in the automation system comes a variety of wiring and connection methods. Moreover, a wide variety of interfaces and tools exist for configuration and parameter assignment of these sensors and actuators.

IO-Link provides a universal physical interface for wiring and a uniform interface for configuration and parameter assignment. The welcomed and long-overdue IO-Link system reduces the wiring and connection methods to a single standard interface on both the sensor and actuator side and the automation system side. Furthermore, configuration and parameter assignment of the sensors and actuators is carried out in a uniform manner using uniform tooling. This represents a significant advantage for users.

[IO-Link](#)

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## A Social Media Milestone

by Carl Henning - Friday, March 04, 2016

<http://profinews.com/2016/03/a-social-media-milestone/>

PI is celebrating a number of social media milestones. The [PROFitelevision](#) and [PROFIblogger](#) YouTube channels are five years old; the [MinutePROFINET](#) YouTube channel is 4 years old. PI North America has been Tweeting since July of 2008. But the ten-year milestone (almost to the day) goes to the PROFIblog. We hope you are following the PROFIblog by visiting the page or having it delivered via [RSS](#). But in case you cannot visit the celebratory, anniversary PROFIblog post, here it is:

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I honestly don't know how this happened. But the PROFIblog started ten years ago... quite inauspiciously. The first post said that we're starting to blog. And check back a couple times a week for updates. Well, the couple times a week proved to be unsustainable. In fact, there were times when posts were few and far between. But for the last several years at least, the posts have come along at least once per week, usually on Tuesday. With occasional help from Michael Bowne and a guest blogger or two the pace continues.

The organization had some ulterior motives for starting a blog. It was rumored to be good for Search Engine Optimization. Somehow, I was the logical choice to be the blogger... er, PROFIblogger. But I like the blog because it gives me a place to express my opinion. Oh sure, sometimes the PROFIblog can be quite newsy. Reporting from a one-day training class or trade show for example. Sometimes the blog provided a place to vent. I used to get really upset when some organization or other maligned PROFINET with false information. (Truth in blogging – past tense in the preceding sentence obscures the fact that I still get upset.)

The PROFIblog disclaimer reminds everyone that what I post is my opinion, even if it is presented as fact. (But if I present it as fact, it's because I think it is!) My posts do not go through an elaborate approval process – actually, no one looks at them prior to them going live.

Almost always the posts are about PROFINET and PROFIBUS, fieldbuses and Industrial Ethernets, networks and automation. And now Industrial Internet of Things and Industrie 4.0. Occasionally I go off topic. Those posts are usually engineering-related, but may be historical. (Click the [off-topic tag](#) for a sampling.) And since prior to the Silicon Valley PROFINET one-day training class I visited the Computer History Museum, there may be another off-topic post soon.

I hope you've learned some things from the PROFIblog in the last ten years, even from the occasional rant, pet peeve, or off-topic post.

And the blogging continues...

--Carl Henning



## New Products - Issue 138

by Michael Bowne - Friday, March 04, 2016

<http://profinews.com/2016/03/new-products-issue-138/>

*Click on a headline or picture below to learn more about the product.*



### [Flowmeters with PROFINET](#)

The newly developed Proline 100 flowmeters from **Endress + Hauser** work according to the Coriolis or electromagnetic measuring principle. The PROFINET interface enables a continuous connection from the controller to enter the meter and thus ensures rapid engineering and easy commissioning.



### [Bringing PROFIBUS and PROFINET to the Cloud](#)

**Hilscher** has announced the netIOT family of embedded IoT connectivity products, cloud gateways and IoT integration tools to make the Industrial Internet accessible today. At launch, the solution family supports connection to existing PROFINET and PROFIBUS networks. The netIOT Edge-Gateways connect field data with IBM's Bluemix platforms and applications supplied “as-a-service”.



### [Gateways Connect PROFIBUS / PROFINET to IT](#)

The new Anybus .NET gateways from **HMS** enable real-time data from industrial machinery to be

presented to .NET-based IT applications. This means that .NET programmers can get data directly from a PLC system on the other side of “the edge” to be used in applications for statistics, analysis, or maintenance. The first .NET gateways are available for PROFIBUS and PROFINET.



### [Compact Industrial Ethernet I/O Modules](#)

**Turck**’s new compact Ethernet multiprotocol I/O modules make standard switching signals quickly and effectively bus-capable. The FEN20 devices with digital inputs and outputs are immediately ready for use in PROFINET systems. The FEN20 devices are available in two different designs. The smaller 4DIP-4DXP, fits in small control boxes. The larger 16DXP variant provides up to 16 I/O.



### [Data-Manager with PROFINET](#)

The new Memograph M RSG45 from **Endress + Hauser** is a compact data management system for the detection of various signals (HART / analog / digital) from the field level, and for the safe storage and visualization of the data. The RSG45 supports PROFINET to further provide the instantaneous values directly into the Ethernet-based control levels.



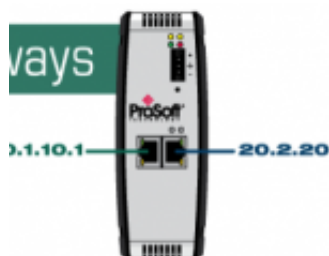
### [Programmable SmartLights with IO-Link](#)

At an automotive body-in-white plant operators were struggling to keep pace with the process. This was causing delays for just-in-time production at the plant. **Balluff** programmable SmartLights were then installed just above the operator stations. They are adaptable to any industrial network or fieldbus with IO-Link communication.



### [Faster Reaction through PROFIBUS Monitoring](#)

Koole Terminals was able to drastically reduce the time needed to run their operations at the port in Rotterdam. Using Combricks from **Procentec**, allowed them to make their oil terminal more flexible than ever. PROFIBUS is the central nervous system of the tank-farm, and talks directly to the valves, flowmeters, and the control room (via Ethernet).



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### [Two-Port Gateway Announced](#)

**ProSoft Technology** has added a two-port EtherNet/IP-to-PROFINET gateway to its PLX30 gateway family. The new gateway features two Ethernet ports, allowing devices that speak two different protocols to reside on separate subnets. Keeping the protocols on two subnets also assists IT personnel by helping them more easily identify the devices in their operations.



### [PROFIBUS PA Interface at a Fingertip](#)

Typically, implementing a PROFIBUS PA field device means developing custom hardware and device-specific software, requiring in-depth PROFIBUS knowledge. The PAeasy from **Softing** combines pre-engineered components suitable for implementing PROFIBUS PA transmitters with minimum engineering effort. The pre-defined transducer block implementation reduces development effort to pure configuration work.

## **PROFINETS**

### **PROFIBUS & PROFINET news from around the world**

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