PROFINEWS

PROFIBUS & PROFINET news from around the world

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Table Of Contents

Welcome to Automation's Evolution

by Carl Henning - Monday, February 01, 2016

http://profinews.com/2016/02/welcome-to-automations-evolution/

An automation evolution exploration from industry veteran Carl Henning.

I've been around PROFIBUS and then PROFINET for a couple decades now and I have to admit that I'm still excited by these technologies. It's been fun to watch them mature and grow. I've been doing automation for decades before that so I've seen the long arc of automation's evolutionary growth. Our evolutionary position is currently the Industrial Internet of Things. And it is an evolution I believe. Automation is arriving where it was going anyway, but now we have a popular name for it – the Industrial Internet of Things (which is a subset of the Internet of Things and Industrie 4.0). With this new-found popularity there are opportunities for us in automation.

When I worked for an OEM way back when, there were projects that I knew really needed done, but management was deaf to the logic. When a new popular initiative was mandated, the needed projects found a justification and got done. I think IIoT is the modern equivalent. Now don't get me wrong, the projects still need to be justified, but now they can be. If you need some assistance in justifying, see my blog post PROFINET – Show Me the Money.

There are already projects that follow the IIoT model. I enjoy reading those application stories. We've published some in PROFINEWS and we have sections of them at profibus.com and us.profinet.com. Sadly, many of the app stories I read online that I know include PROFINET, don't say "PROFINET." They don't say that the machines connect to electricity either – PROFINET is just part of the infrastructure apparently.

Make PROFINET part of your infrastructure!
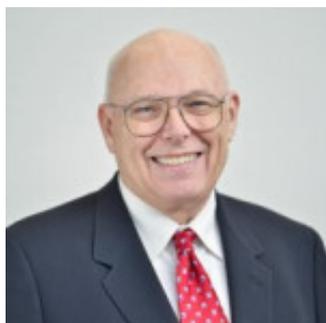
Carl Henning, Deputy Director, PI North America
Editor, PROFINEWS
The PROFIblogger

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Training (Cities, Classes Added)

by Carl Henning - Monday, February 01, 2016

http://profinews.com/2016/02/training-cities-classes-added/

In North America, additional cities have been confirmed for no-charge PROFINET one-day training classes and additional Certified Network Engineer classes are announced. Free PROFIBUS and PROFINET training is coming to the UK. PI Australia formalizes its Automation Innovation Summit. In Germany IO-Link, PROFIBUS, and PROFIsafe training is scheduled.

PROFIsafe training in Germany

(in the English language)

There are three different training classes being offered specifically for PROFIsafe Designer Certification in 2016. All three take place in Karlsruhe/Germany.

PROFIsafe has an installed base of over 4 million nodes with huge growth in recent years. The workshop is aimed at users, planners, systems integrators and original equipment and component manufacturers.

1. PROFIsafe Certified Designer Training Course (English language), **March 1 – 3, 2016**
2. PROFIsafe Certified Designer Refresher Seminar (English language), **October 6, 2016**
3. PROFIsafe Certified Designer Training Course (English language), **October 11 – 13, 2016**

The quality of PROFIsafe products and systems depends on the quality of the know-how of the development teams and on the deployed methods and procedures. The responsible PI working groups, in cooperation with TÜV, developed a Certified Designer Training Course (March 1-3; October 11-13), which is available to all employees in charge of PROFIsafe and safety. The Refresher Seminar (October 6) is targeted toward existing Certified Designers needing an update within 3 years to prolong their certificate according to the PROFIsafe policy.

PROFIBUS and PROFINET free training in UK

Practical Aspects of PROFIBUS and PROFINET (and IO-Link) - **Feb 25, 2016 in Coventry**

Back by popular demand, this free-to-attend seminar addresses the key practical issues arising from the use of digital communications technologies in automated manufacturing and process industry applications.

Details and Registration

North America PROFINET no-charge classes

CITY	2016 DATE (CALENDAR WEEK)
San Diego, CA	Feb 2
New Orleans, LA	Feb 18
Silicon Valley, CA	Mar 1
Kansas City, MO	Mar 15
Greenville, SC	Mar 29
Oklahoma City, OK	Apr 12
Portland, OR	Apr 26
Philadelphia, PA	May 10
Cleveland, OH	Jun 7
Milwaukee, WI	Jun 22
Boston, MA	Sep 1
Detroit, MI	Oct 6
Nashville, TN	Wk 43
Cincinnati, OH	Nov 3
Houston, TX	Wk 47
Jacksonville, FL	Wk 49

For North American Certified Network Engineer classes visit this training page.

PI Australia Automation Innovation Summit

During the combined 2016 PROFIBUS and PROFINET Global Forum and Automation Innovation Summit, PI Australia will aim to create an understanding of industrial network technology as an integral support tool for innovation in automated systems, and as an avenue for revitalizing Australia's mature industries and raise productivity output.

We will reveal the innovation potentials for industries such as manufacturing, food and beverage and mining that have long existed, but needed the right tools and thinking to yield improved productivity outcomes. **May 25 in Sydney, Australia**

For details visit PI Australia

IO-Link training in Germany

Dates have been set for the first two user workshops of the IO-Link member community in 2016. Interested parties will receive comprehensive insight into the IO-Link technology in Germany on **March 3 in Bad Rappenau** and on **June 23 in Essen**.

Registration

PROFIBUS training in Germany

ABB Workshop Z2160 – PROFIBUS made easy
Dates (1-day):

- Tuesday,   **April, 19, 2016 in Leipzig**, Germany
- Thursday, **April, 21, 2016 in Ratingen** (near Düsseldorf), Germany

Workshop language: German!
The workshop teaches you PROFIBUS in theory and in practice from the field device to the controller. You will learn the basics of PROFIBUS so that the design, calculation and commissioning of a bus system is no longer a challenge. In practical exercises you will learn by your own to select the right PROFIBUS network components and to calculate the bus topology. Another focus is the collective start up of a small PROFIBUS application: from the physical build-up via the bus diagnostics, parameterization of a field device up to the integration into an ABB control system.

The workshop is intended for decision makers, planning and project engineers, commissioning engineers, and service staff. Prerequisites are knowledge of basic process measuring and control technology.

Content:

- PROFIBUS DP and PA basics*
- Network component selection
- Layout calculation (Physics and cycle times)
- Build-up a small network including bus diagnostics
- Device parameterization via DTM
- Integration of a field device into an ABB controller (Freelance) up to the visualization

* PROFINET is not part of the workshop

[Link to register](#)

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The Data-Driven Factory

by Carl Henning - Monday, February 01, 2016

http://profinews.com/2016/02/the-data-driven-factory/

Being in the business of moving data with PROFINET, references to the data-driven factory* appeal to PI. Appealing as that is, it's an incomplete story. Like a word-driven blog post. Random words collected do not a blog post make. Random data collected does not a factory drive. Data is the raw material. Turning it into useful information that can be acted upon is the challenge. Fortunately, PROFINET provides a good start in meeting that challenge. First of all, PROFINET delivers more than bits and bytes, coils and registers; it delivers values in engineering units, the engineering units, quality information, and more. Furthermore, those values and other attributes can be arranged in objects (we call them application profiles). For example, drives are used in most automation projects and we have a PROFIdrive object that arranges information in a vendor-neutral way. Instead of researching all drive values names and locations for each brand of drive, just use PROFIdrive.

But what if the data is not accessible? What happened? PROFINET provides comprehensive diagnostic information from individual channels so can report "motor start output has a broken wire," for example, to network status. Maximizing uptime is a benefit of PROFINET derived from diagnostics and redundancy of networks, devices, and controllers.

So PROFINET gets "data" to controllers, but that's not the end of the journey to a data-driven factory. Once in the controller, additional manipulation takes place; like, "conditions are met to start the motor." From the controller up, PROFINET partners with OPC UA. OPC UA is designed to securely amalgamate the data into information and deliver it to HMIs, historians, and analytics. Then the feedback loop can be completed and action taken to improve the production process.

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*The data-driven factory fits in the concept of Industrial Internet of Things (IIoT), Industrie 4.0, and the PROFINET of Things.

PROFINET Quiz

by Carl Henning - Monday, February 01, 2016

http://profinews.com/2016/02/profinet-quiz/

In the very first issue of PROFINEWS North American Edition way back in March 2005, there was a PROFINET quiz. Taking a few questions from there and adding some more allows us to present the 2016 PROFINET Quiz:

(click "TRUE" or "FALSE" below to see if you are correct)

1. PROFINET is PROFIBUS on Ethernet. TRUE or FALSE

2. PROFINET fully complies with standard Ethernet IEEE 802.3. TRUE or FALSE

3. PROFINET can use an unmanaged Ethernet switch. TRUE or FALSE

4. PROFINET is proprietary. TRUE or FALSE

Did you miss some? You might want to read the PROFINET System Description.

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Tech Tip: Suite and Simple Network Management with PROFINET

by Carl Henning - Monday, February 01, 2016

http://profinews.com/2016/02/tech-tip-suite-and-simple-network-management-with-profinet/

In the automation environment of today and tomorrow, end users need a system which is

built with effective diagnostic capabilities and is easy to manage at both the network and application levels for minimum downtime and increased productivity. PROFINET should be your network of choice because it has best in class diagnostic mechanisms which are in short: 'suite and simple'.

The diagnostics 'suite' comes from PROFINET being built on standard IEEE 802.3 Ethernet allowing the use of **I**nformation **T**echnology (IT) protocols such as **S**imple **N**etwork **M**anagement **P**rotocol (SNMP), **L**ink **L**ayer **D**iscovery **P**rotocol (LLDP), and **H**yper **T**ext **T**ransport **P**rotocol (HTTP) as part of its communication architecture. This is a plus for PROFINET and different from competing protocols as most of the time this information is built directly into the devices by design and tested in products that support it, hence making network management on PROFINET much more reliable and stable. In addition, the PROFINET application protocol has a focus on diagnostics which can provide details about the application and process. This suite of protocols makes diagnostics easier for the user to implement their application without having to write their own diagnostic protocols and specific routines for the application.

Since PROFINET uses standard Ethernet it means that the network can support many protocols at the same time and multiport switches are used (which are typically built directly into the devices). Therefore, diagnostic methodologies from the office world and IT can then be leveraged and information obtained from the device(s) at any time. And many Industrial PROFINET products also support this so you can make use of this data on your **H**uman **M**achine **I**nterfaces (HMI).
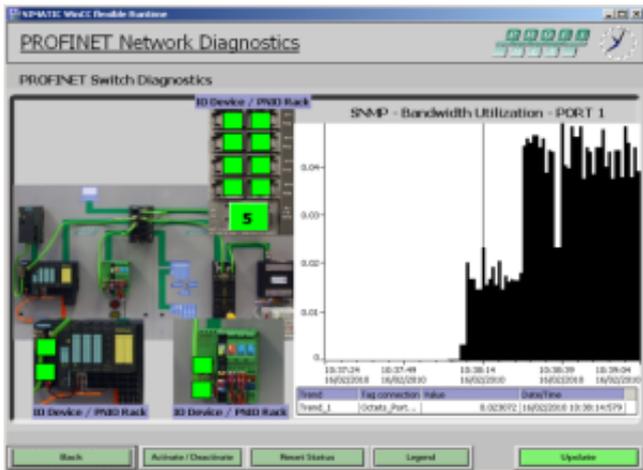
Figure 1: Reading SNMP info from device ports

This is where the term "simple" comes in for simple network management when using PROFINET. The SNMP protocol can be used to gather information from the network components (switches and devices) and let control engineers know the current status of the network health (Fig 1). The reason SNMP is called "simple" is that it is based on a polling protocol which supports up to nine commands, the most common are get, set, get bulk, response, inform, trap, etc., and can read data from the devices using off the shelf tools over **U**ser **D**atagram **P**rotocol (UDP/IP) and in some special cases write information. Your local IT department likely already has something like this, so your first resource for SNMP might be internal, otherwise many other companies offer SNMP tools and information. Some tools can even be obtained free of charge but without support and commercial versions might have more features and support included. We often use the tools from PRTG in our classes for network management or SNMP OPC Servers from various vendors to obtain that type of information in HMIs which might not support SNMP natively.
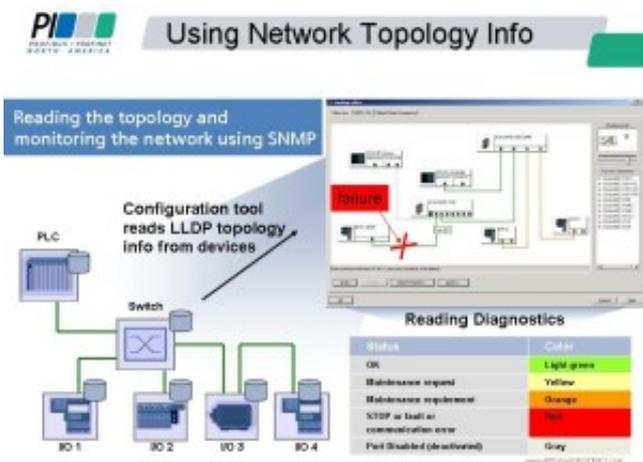

Figure 2: Reading Topology diagnostics and network status from devices

The types of information you can read with SNMP could be for instance, **C**yclic **R**edundancy **C**heck (CRC) errors, number of retransmits, bandwidth utilization, which is highly important when looking at network loads, or no link on the switch port (i.e. Port status). LLDP works in conjunction with SNMP to gather 'topology' information for network topology discovery or simple device replacement without

special software tools (Fig 2).

Another IT protocol, HTTP allows engineers to use just a standard web browser to see information about the devices with built in web pages or to configure devices. Other devices might even offer other services such as email in case of an issue, **F**ile **T**ransfer **P**rotocol (FTP) to copy files like a project or PROFINET GSD file, or a telnet connection to do configuration through a basic command interface.

We'll cover more about about LLDP, network management features, and the PROFINET application diagnostic side of things in our next tech tip. Remember to check with your vendor on these features to understand how to best employ them in your applications.

In conclusion, PROFINET has the most collective and comprehensive diagnostics suite available of any Industrial Ethernet protocol and its focus is to be simple. This helps make it easy to manage your network, implement diagnostics in your applications, and keep downtime to a minimum.

To learn more and see how simple it is and learn firsthand, attend one of our hands-on PROFINET Certified Network Engineer classes in the near future.

From the PROFI Interface Center in Johnson City, TN.

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PROFIsafe is First National Safety Standard in China

by Carl Henning - Monday, February 01, 2016

http://profinews.com/2016/02/profisafe-is-first-national-safety-standard-in-china/

Following successful standardization of PROFIBUS and PROFINET in China, PROFIsafe – the first and only communication-based safety standard in China – has now been elevated to the status of a Chinese national standard. This is further evidence that the world leading PI technologies are highly regarded in China – not just because of their high quality but also based on their large installed base and reliable organization. Functional safety has long played a very important role in production facilities in industrialized nations. The importance of functional safety in China has risen enormously in recent years.

The use of fieldbus-based functional safety not only enables the setup of simple safety functions that initiate safe stopping of equipment under hazardous conditions in order to protect humans and machines. It also offers intelligent methods for prevention of hazards without having to stop production with a shutoff device. An example of this would be to reduce the speed of robot motions or self-driving vehicles to an extent that people moving in their vicinity can easily evade them. PROFIsafe provides a very sound technological basis for this and supports these functions within the framework of profiles.

After successful conclusion of all standardization activities and votes in the national standardization committee, establishment of a certification lab for PROFIsafe devices, and successful development and certification of an initial product by an original Chinese company, PI has met all requirements for the status of a national standard and is listed under designation GB/T 20830-2015.

This was acknowledged in an official ceremony in the presence of more than 100 high-level representatives of the Chinese economy and universities in which PI Chairman Karsten Schneider participated. Leading up to this, experts from PI and the PI Competence Center and ITEI test lab (Instrumentation Technology & Economy Institute, P.R. China) in Beijing collaborated closely with the Chinese national standardization committee SAC/TC124 Industry Process Measurement and Control.

The Social Engineer

by Carl Henning - Monday, February 01, 2016

http://profinews.com/2016/02/the-social-engineer/

How can you tell an engineer has social skills? When he's talking to you, he's looking at your shoes. Actually, he's probably messaging you on his smartphone, even if he's sitting beside you.

The electronically-social engineer has many non-face-to-face options for communications. Following Twitter experts. Reading blogs. Reading newsletters. Watching YouTube videos. Visiting forums and LinkedIn groups. And maybe Facebook. Here are some suggested sites for the electronically-social engineer.

Twitter: @AllThingsPROFI and @PIChairman for news related to PROFINET and PROFIBUS, Industrial Ethernet and fieldbus, IIoT and Industrie 4.0, and all things network and industrial automation.

Blogs: www.PROFIblog.com includes news and opinion plus the occasional "secret" like Picking PROFINET Cities

Newsletters: www.profinews.com for monthly updates on PROFI topics. Visit the website monthly or subscribe to the emailed condensed version. Is that how you got here?

YouTube videos: your control vendor probably has a YouTube channel, but for vendor-neutral, educational videos, visit MinutePROFINET for quick looks at PROFINET benefits and PROFItelevision for more educational videos. Try this playlist to watch all the MinutePROFINET videos in order. This playlist includes four videos on the "PROFINET of Things." For PROFIBUS, this playlist presents five videos on PROFIBUS benefits.

Forums: There are three forums you may want to try individually or all at once:

- International PI website
- PI North America website, PROFIBUS and PROFINET

- LinkedIn groups, PROFIBUS & PROFINET and PROFINET

Facebook: PI International and PI North America

The (electronically-)social engineer is welcome at all the above virtual places.

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PI to Start Encoder Certification

by Michael Bowne - Monday, February 01, 2016

http://profinews.com/2016/02/pi-to-start-encoder-certification/

To ensure that everything runs smoothly in drive technology, clean interfaces between all components involved are required. The long-established certification process of PI (PROFIBUS & PROFINET International) ensures that users around the world can rely on uniform and interoperable communication and application interfaces. To further ensure the interoperability of drive and motion control applications, certification of products with the Encoder profile will be available starting immediately.

The Encoder profile belongs to the application profile class and, together with the PROFIdrive profile, defines uniform interoperable application interfaces for the different fields of use of drive technology and motion control based on PROFINET and PROFIBUS.

For a fully-automatic sequence and an automatic evaluation of test cases, the proven PROFIdrive profile tester will be used for the encoder certification test. A special test script set was developed for encoder certification, which is available for the latest profile tester version and controls the test sequence and the test evaluation for encoder devices in the test system. This increases the quality, reduces the test effort, and keeps certification costs low.

Like the PROFINET tester, the PROFIdrive profile tester with the encoder test scripts is also available to PI members as a free download. Encoder manufacturers thus have the opportunity to use the test system during development so that the certification test can be performed on a pretested device. The certification test will be performed by experienced PROFIdrive test labs.

Successful Year for IO-Link

by Carl Henning - Monday, February 01, 2016

http://profinews.com/2016/02/successful-year-for-io-link/

2015 ended successfully for IO-Link. At SPC IPC Drives, 39 members of the IO-Link member community presented 170 devices and components under the motto "*Enabler for Industrie 4.0*". The various sensors, actuators, masters, and services illustrate the possibilities of high-performance point-to-point communication. More and more companies are convinced of the benefits. This is demonstrated by the member count, which increased by 36% in 2015 to 112 members, and by the increasing number of installed nodes, which is now well over the 3 million mark. At the end of 2014, there were only 2.19 million installed nodes.

The interest in IO-Link is growing internationally as well. Evidence of this can be seen in the strong attendance numbers at workshops held in 2015 in the U.S., the Netherlands, Poland, Milan, and Prague, among other locations. The IO-Link member community wants to continue its successful concept in 2016.

Product News

by Carl Henning - Monday, February 01, 2016

http://profinews.com/2016/02/product-news-3/

Balluff, Banner, and Murrelektronik have IO-Link product news. GE's Automation and Controls provides a video first-look at their high-density I/O with PROFINET connectivity. Softing provides a PROFIBUS PA developer kit and a story of using their tools for PROFIBUS diagnostics. Industrial Data Xchange announces a StarNET Gateway for PROFIBUS.

Click the headlines for more details.

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