

PROFINEWS

PROFINET and PROFIBUS News

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Achema 2015: A clear commitment to PROFINET in the process automation world

The Who's Who of the process industry came together at ACHEMA 2015. Numerous innovations could be seen and all participants engaged in lively exchange with scores of customers and interested parties. PROFIBUS and PROFINET International aroused the interest of many visitors with publication of its White Paper "*PROFINET – The solution platform for process automation.*"

Achema is the world's largest process industry trade fair for chemical technology,



process technology, and biotechnology. The major trade fair takes place every three years in Frankfurt am Main, Germany. This year the key topics were industrial water management, process analytical technology, and bio-based production. The organizer Dechema draws a positive balance and the numbers speak for themselves. Over 3800 exhibitors were represented at the trade fair and more than 166,000 visitors learned about trends and products of the chemical, pharmaceutical, and food industries.

One of the impressive things about Achema is the glimpse it gives visitors into the enormous diversity of products and manufacturers along the value-added chain in the process industry. This unique impression arises, starting with CAD software for system design and continuing with pipe fitting and metal construction, materials engineering, sensors & actuators, automation engineering, laboratory equipment, as well as finished plant units (skids) and even complete turnkey plants, and finally culminating in the end products of chemical technology, process technology, and biotechnology. Many manufacturers also introduced safety and maintenance concepts. Alongside this were a wide variety of lecture and discussion forums as well as numerous university booths, which provided insights into current research and important future topics.

Within this impressive supply chain, PROFIBUS and PROFINET International positioned itself in Hall 11 where visitors came to learn about instrumentation and controls and process control technology. Together with other user organizations committed to digital communication technology, a variety of automation companies demonstrated the benefits of digitalization down to the field device level at the "Field Communication Lounge". There were stimulating discussions and live demonstrations of PROFINET, PROFIBUS, and FDI. Another subject of hot debate was a new physical layer for intrinsically safe 2-wire Ethernet.

The highlight for PROFIBUS and PROFINET International this year was the White Paper "*PROFINET – The solution platform for process automation.*" In this paper, numerous well-known manufacturers explained how in the future PROFINET will also prevail in process automation thanks to its current properties and the properties that are under development or in the planning phase. Of primary interest here is the addition of PROFINET to PROFIBUS PA Profile 3.02 (currently undergoing specification) in combination with new features and plans to downsize the profile. It was clear from numerous discussions with field device, control system, and network infrastructure manufacturers involved, that end users can expect some new products related to this work in the near future.

I am pleased to take part, together with users, interest groups, and manufacturers, in this exciting undertaking. I am confident that by the next Achema (June 11-15, 2018), we will be able to show that a major part of the roadmaps and plans have been brought to life!



Karl Büttner, Co-Leader of PI's Process Automation Marketing

Working Group

The Industrial Internet of Things Is All About the Data

A look at how the industrial application of the Internet of Things concept makes for a very different use of data than the consumer Internet of Things and how Profinet sources the industrial data needed via an open standard.

It should have been called the Industrial Internet of Data. It's the data that gets saved and analyzed to provide the benefit of improving industrial processes. That data originates in devices like buttons and switches, in complex sensors and actuators, in vision systems, and drives. The data gets manipulated, logic is applied, and control algorithms completed in controllers like PLCs, DCSs, and PACs. From there it emerges in organized fashion to be displayed, stored, and analyzed.

As a result, the use of this data is very different for the Industrial Internet of Things (IIoT) than it is for the consumer Internet of Things (IoT). For starters, the "things" are obviously different—it's refrigerators, and smart phones for IoT, and industrial devices like drives, vision systems, and robots for IIoT. IIoT data is put to much more rigorous use and its analysis impacts the very efficiency of the process being controlled.

It's critical that the data be available through open standards. At last count there were no less than half a dozen organizations, associations, or consortiums promoting Internet of Things connectivity.

Traditionally, organizations create standards, and users pick the winners. IIoT-related associations, however, are not creating standards—they're recommending them. This makes sense because the protocols for industrial automation are already well established and don't always involve Ethernet like the IoT. And there will always be non-Ethernet networks in industry because it is economically infeasible to add Ethernet to inexpensive devices. For example: devices on networks like AS-interface for simple switches and actuators; and IO-Link, though not a network, which is used to connect intelligent sensors and actuators. HART, though not a network, connects intelligent process instruments. Then there are networks like Profibus PA and Foundation Fieldbus, which are suitable for hazardous environments where Ethernet is not. Plus there are more than 100,000,000 nodes of legacy non-Ethernet networks already installed.



This is where Profinet and the IIoT converge. Profinet gathers data from simple and complex devices; new and legacy devices; and devices that will never have an RJ45 connector. Profinet does this through proxies. A proxy is like a gateway in that it connects two disparate networks, but the mapping is defined in the standard.

Newer devices from I/O blocks and controllers to complex motion control systems and robots support Profinet natively. With proxies integrating legacy and non-Ethernet devices, Profinet provides a data backbone for gathering IIoT data.

So, although standards for IoT are a work in progress, the IIoT already has the open standards needed, and Profinet is the open standard that can provide data from both new and legacy devices.

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

Tech Tip: Understanding PROFIBUS Diagnostics Part 2

PROFIBUS's success in the industrial controls universe is partly due to its wide array of diagnostic capabilities. Every PROFIBUS slave device must support, at a minimum, 6 bytes of standard diagnostic data. This data is defined by PROFIBUS and PROFINET International and reports the device state, its controlling master and whether the device has any extended diagnostic data (additional fault information) available.

Editor's Note: This is the second of a series of tech tips that explain how PROFIBUS diagnostics work and how they can be used to make critical information available to a PLC or DCS. The first tech tip is [here](#).



Figure 1: Standard 6 Bytes Diagnostic buffer

PROFIBUS Extended Diagnostic Information may be encoded in 3 different formats: Device Related Diagnostic, Identifier Related Diagnostic and Channel Related Diagnostic. The first two bits of the diagnostic block indicate the encoding. For Device Related and Identifier Related, the remaining 6 bits tell us the total length of the diagnostic block, including the header. For Channel Related diagnostics, the block is always 3 bytes long. An Extended diagnostic may contain one or more of these blocks in any combination.

Device Related Diagnostics are designated by the two most significant bits being set to **00**. The possible meaning of the bits is completely up to the device vendor (PROFIBUS and PROFINET International does not specify the meaning of the bits). Usually the Vendor describes the meaning of the diagnostic bits in the slave GSD file. See figure 2.

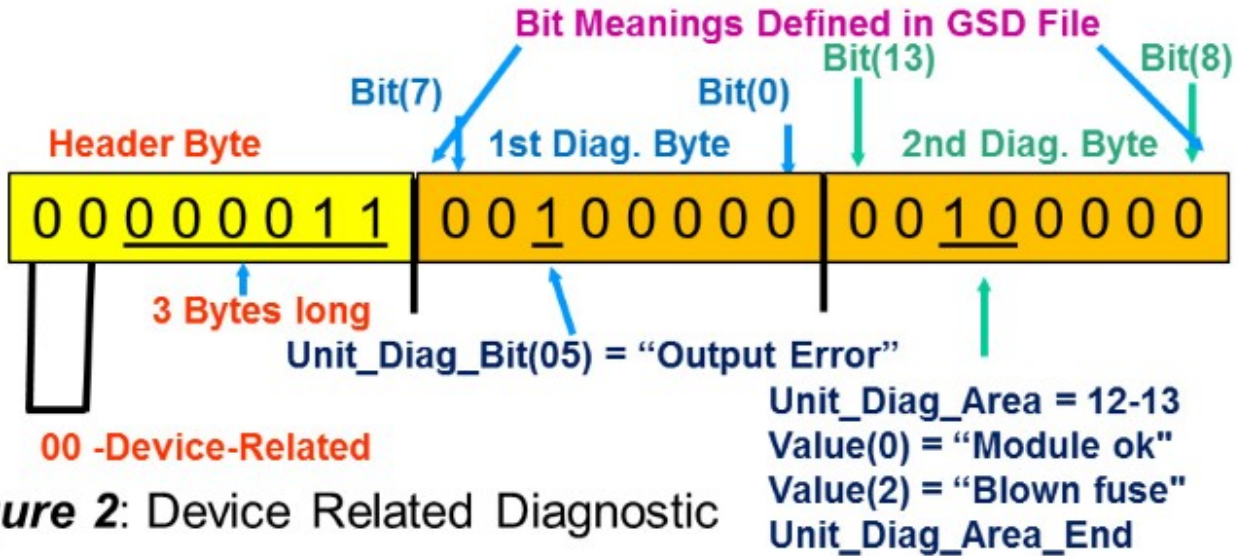


Figure 2: Device Related Diagnostic

Identifier Related Diagnostics are designated by the two most significant bits in the diagnostic header being set to 0 1. Each bit in the following bytes of the ID Related Diagnostic represents a plug-in module with a diagnostic condition. See Figure 3.

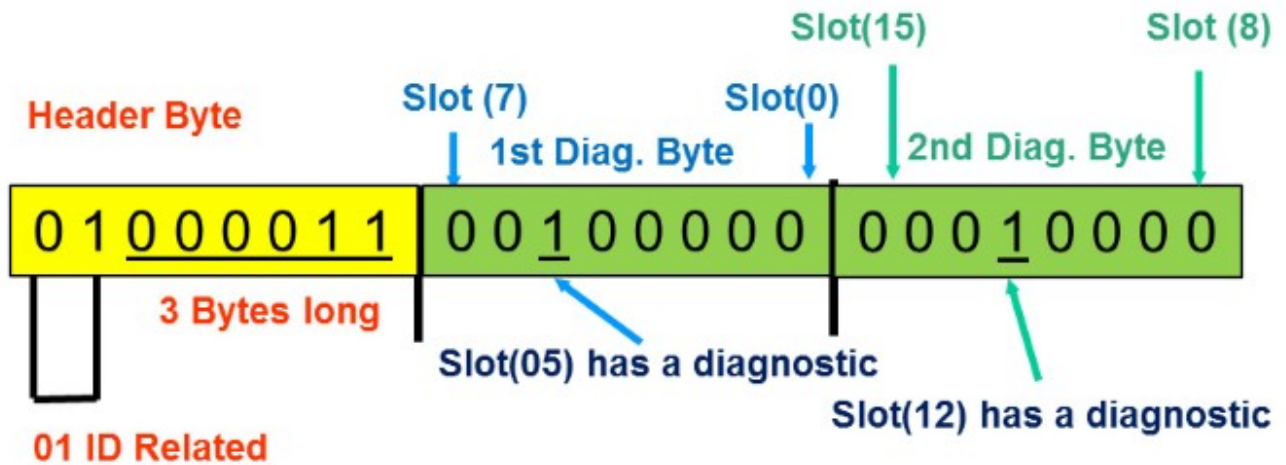


Figure 3: Identifier Related Diagnostic

Channel Related Diagnostics are designated by the two most significant bits in the diagnostic header being set to 1 0. The information available in a Channel Related

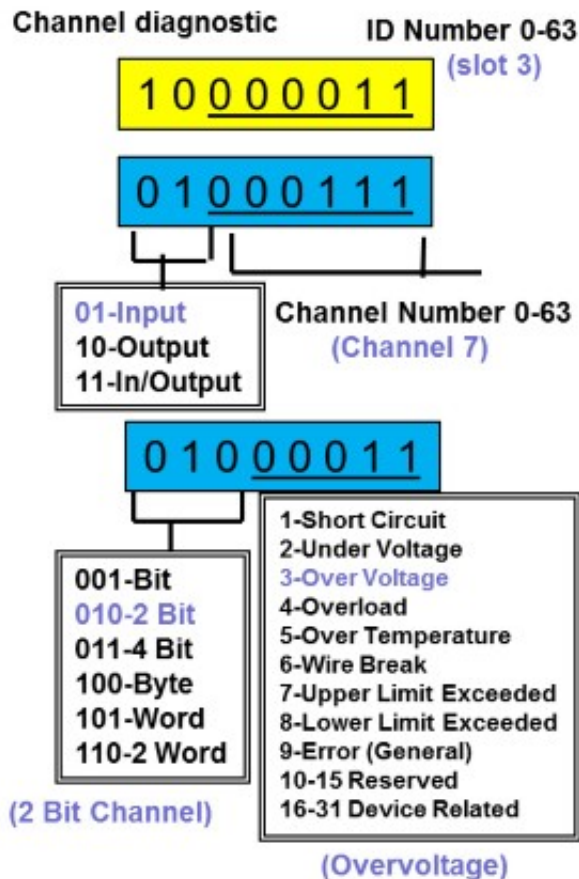


Figure 4: Channel Related Diagnostic

diagnostic includes the module number within the slave, the input/output type, the channel size, the channel within the module with the diagnosis and a diagnosis code for the problem that was detected. Please see figure 4 for the details.

Many devices support all three types of extended diagnostics, and some even allow the selection of which type/types of diagnostics to report as a parameter.

In order to fully take advantage of the diagnostic possibilities, the application code in the PLC/DCS must be able to read the diagnostic buffer of a slave reporting extended diagnostics. It must decode the diagnostic information and display it in a form that is easily understood by the maintenance personnel.



John Swindall, [PROFI Interface Center](#)

A Pair of PROFIBUS Application Papers

Snijders Intelligent Automation designs and manufactures electrical panels for many industrial and commercial sectors, including maritime. The Barwon Water biosolids drying facility is a fully enclosed thermal drying operation in Australia. Both are using PROFIBUS to maximize transparency and uptime.

Snijder's monitors PROFIBUS in hazardous environments

Snijders Intelligent Automation designs and manufactures electrical panels for many industrial and commercial sectors, including maritime. Snijders is responsible for designing, constructing, installation and commissioning of a finished system. Snijders recently fully automated and installed PROFIBUS in four newly built tankers. These tankers have various potentially explosive atmospheres for which ATEX directives apply. That is why Snijders used the ComBricks RS 485 Intrinsic Safety barrier modules by PROCENTEC. This allows for 24/7 remote monitoring of the PROFIBUS installation from a safe zone.

Click an image to view gallery

[Read the Application Story here.](#)

Barwon Water increases PROFIBUS network reliability and robustness

The Barwon Water biosolids drying facility is a fully enclosed thermal drying operation in Australia. The facility provides an environmentally sustainable, long-term solution for reclamation of 100% of the biosolids produced at the Barwon Water's Black Rock and smaller regional water treatment facilities. In order to keep the PROFIBUS system going, Barwon Water uses PROCENTEC ProfiHubs. By using these multi-functional network components the facility is continually assured of the most reliable, high quality and robust PROFIBUS network with the highest uptime.

Click an image to view gallery

[Read the Application Story here.](#)

IO-Link: Did You Know?

Did you know that IO-Link wiring needs only 3 wires of a parallel cable instead of 19?

The simple motto 3 instead of 19 wires vividly describes the saving potential of IO-Link compared to conventional wiring. The user benefits are made clear using the example of a passive distributor with 8 M12 connections. For comparison purposes, an IO-Link input module that can be connected to any IO-Link master is used.

For 8 sockets with 2 digital inputs each, a total of 19 wires are needed for conventional wiring. This is reduced to only 3 wires for IO-Link. This results in significant copper savings, and the weight is reduced by two-thirds. Taking into account the costs for manual wiring to terminals and the reduced volume of parallel wiring, there are thus 3 additional good reasons to use IO-Link.

Slim 3-wire cables can be routed in a space-saving manner, have smaller bending radii, and are also available in a trailing cable-compatible variant. For system planners, this yields leaner, standardized wiring diagrams that can be quickly and easily duplicated with Copy and Paste.

Installers complete their task faster. Each terminal point signifies a potential error source. The effort to find such errors entails time, money, and stress. Fewer terminal points and an active IO-Link communication results purposefully in reliable wiring.

For smart sensors with integrated IO-Link, the savings are on the PLC side. Here, the transmission of multiple analog values to the previously-required input cards can be omitted. Instead, IO-Link provides up to 16 analog measured values via the 3-wire connection.

[IO-Link](#)

Magazine Article Recap

Through the first half of 2015 there has been a flurry of activity in the magazine press relating specifically to PROFINET, PROFIBUS and of course IIoT. Here's a recap of those articles to stay up to date on the latest coverage.



[Standards and Protocols for the Industrial Internet of Things](#) -- Automation World magazine

A look at how open data access protocols like Profinet can be used to provide data for Internet of Things deployments.

[Industrial Internet of Things needs data, clouds, and analytics](#) -- Control Engineering magazine

Without data there can be no big data, clouds, or analytics. The Industrial Internet of Things (IIoT) differs from the Internet of Things (IoT); IIoT's things make IoT's things. Open standards are an important requirement for IIoT, and Ethernet and software standards are available to deliver data for control and information for decision making. [Also in [Plant Engineering magazine](#)]

[The Industrial Internet of Things Is All About the Data](#) -- Automation World magazine

A look at how the industrial application of the Internet of Things concept makes for a very different use of data than the consumer Internet of Things, and how Profinet sources the industrial data needed via an open standard.

[The Internet of Things Inside Grain Operations](#) -- Automation World magazine

Riceland Foods deploys a Profinet system devised by TempuTech that monitors hundreds of sensors to boost operations and safety, reduce downtime, and deliver operating intelligence for continuous improvement.

[IT/OT guide to deploying Ethernet on the plant floor](#) -- Industrial Ethernet Book

There are numerous advantages to using Ethernet on the plant floor, and also critical issues to consider for a successful implementation: migration strategies, communications differences, security needs and the need for industrially hardened devices. IT and OT personnel need to work together to deploy networks.

[Profibus and Profinet troubleshooting. Comprehensive guide](#) -- InTech magazine

One of the strengths of fieldbuses and industrial Ethernet protocols in general, and Profibus and Profinet in particular, is the diagnostic information. This diagnostic information can prevent downtime and accelerate troubleshooting. Includes a link to www.PROFIdiagnostics.com.

Training and Events

New training events have been announced in North America for Toronto and Seattle. In Europe, training is being offered across the continent for both PROFIBUS and PROFINET Engineers and Installers.



[PROFINET One-Day Training Class - Toronto](#)

Just announced!

This **FREE** class prepares the student to apply PROFINET in his own project. *Lunch is included.* Technical details of the technology are provided along with practical demonstrations. Each student will receive a certificate for 5.5 Professional Development Hours (PDH). Exhibits by device manufacturers are available during breaks.

[Details / Register](#)



[PROFINET Certified Engineer - Seattle](#)

Just announced!

These classes are intensive, hands-on, four day training programs conducted by the PIC. Attendees passing the test will receive an official PROFINET Certified Network Engineer Certificate and 24 PDH hours.

[Details / Register](#)

[Training in Europe](#)

In **Italy** (Brescia and Genoa) classes are being offered in July. In Wateringen, **Netherlands** at PROCENTEC classes for both PROFIBUS and PROFINET are available in August. In **Germany** (München and Nürnberg) training is being offered during the month of July.

[Click here for the full list](#)

Regional News

PI News from around the world comes from Australia, Italy, and the UK. PI Australia just completed their annual general meeting with positive results; will host a one day PROFINET & PROFIBUS Expo; and announces training courses for later this year. PI Italy had a successful show with an award-winning PROFienergy paper. PI UK reports on their recent conference.

Australia

PROFIBUS Australia (PAA) has announced a profit for the 2014 Financial Year, but forecast a softer financial return in 2015 following a slowdown in Australia's resources sector.

PAA made these announcements at its 2015 Annual General Meeting, held at Burkert Fluid Controls' premises in Sydney on May 28, 2015. The 2014 Financial Year results represent the second consecutive year of profits for PAA.

With Australia's resources sector being a major user of PAA's Certified training courses, the association predicts that the slowdown in that sector will reduce its revenue during the current financial year.

However, PAA says the drop in revenue will not affect its promotional plans for 2015 and 2016, announcing a wide range of promotional initiatives.

PROFIBUS International Conference

The annual international PI Meeting will be held in Sydney in May 2016.

PROFINET & PROFIBUS EXPO

The one day PROFINET & PROFIBUS Expo will follow the PI International Conference, at the Australian Technology Park in Sydney on Wednesday May 25, 2016.

Many of the PI delegates, leading experts in Industrial Networks and Automation Technologies, will be guest speakers at the Expo's one-day Forum.

PROFIBUS and PROFINET Certified Training Courses

This series of training courses will run in October/November 2015. They will feature the newly elected Global PITC Chairman, Peter Thomas, an experienced trainer and recognized authority on PROFIBUS and PROFINET.

The Certified Training Courses will be conducted in Auckland, Perth, Brisbane, Sydney and Melbourne. Advanced bookings are now open, and can be made on the [PAA website](#).

2015 Executive and Marketing Committee

PAA has also announced the elected 2015 Executive and Marketing Committees. Due to the busy year of planning ahead, the 2015 Marketing Committee will be larger than usual.

[PI Australia](#)

Italy

PROFINET for the Energy Efficiency awarded at SPS IPC Drives Italy 2015



Vice President Alberto Sibono, Prof. Micaela Caserza Magro, President Giorgio Santandrea

PI Italy keeps on with its education and formation activities in order to present and promote the technological innovations of PROFIBUS and PROFINET. In particular, this year at SPS IPC Drives the consortium took part at the Round Table “Appointment with Technology” and Micaela Caserza Magro (professor at the Engineering Department of the Genova University & partner of the Genova Competence Centre GFCC) won the second place in the category “Projecting Efficiency” of the SPS Award – Scientific Paper Symposium Award.

The essay entitled “PROFINET for the Energy Efficiency” shows how today the energy efficiency is one the most important themes in the industrial sector and how companies are working hard on it. Therefore, it’s clear that it is important to integrate energy management and monitoring in the communication structure easily and effectively.

Besides the participation at the round table, PI Italy hosted some of the consortium’s members: Camozzi, C.S.M.T., Deutschmann, Elap, G.F.C.C., Laumas, Pepperl+Fuchs, Phoenix Contact, Profichip, Siemens. They presented all their products’ news and products. Many visitors came to Pi Italy booth to meet the experts.

[PI Italy](#)

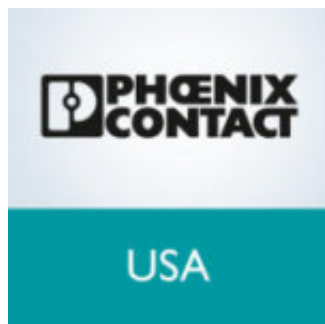
UK

The PROFIBUS Group was founded in May 1993. Twenty two years later, we're still celebrating, this time with a two-day Conference with Workshops and Table Top Exhibition held 23-24 June 2015 at The Stratford Manor Hotel, Stratford-upon-Avon, where we have held our conferences for a number of years. Read more at the [PI UK website](#).

Member News

In member news this month, Phoenix Contact has introduced a hybrid magazine+catalog App for the iPad. It contains both topical articles as well as a product library. Delta Computer Systems is expanding its work space to accommodate new personnel and expanded training and test labs.

Phoenix Contact USA announces iPad App



The app acts as a product library. You download the app itself, and then the most recent issue. You can find the app by searching “Phoenix Contact” in the iPad App Store.

The Spring 2015 issue features:

- North American Cordsets – hundreds of standard configurations, ready to ship and priced right
- Designline IP65 industrial PC (screen example right) – attractive, fanless, energy-efficient design
- MINI Pro – analog signal conditioners with an ultra-narrow footprint
- ME-IO housing – customizable I/O with integrated-front connectivity
- mGuard Secure Cloud – industrial remote secure connectivity
- QUINT power supplies and UPS solutions – customizable connections

We plan to have three or four updated issues per year, depending on the number of new products introduced. Once you’ve downloaded a specific issue, the content resides on your iPad, so you don’t have to access the Internet (unless you choose to follow a link to the Phoenix Contact website to review more information). If you need to clear out space, you can use the gear icon in the corner to delete old issues.

[Download App](#)

Delta Headquarters Buildout adds Space

Delta Computer Systems, Inc. is expanding its work space to accommodate new personnel and expanded hydraulic motion control training and test labs.



"In 2009 we grew out of available space at our old location and after 25 plus years the time was right to build a new building," stated Steve Nylund, Delta's CEO. "The new facility was designed to meet 2009 and future requirements, with special features such as ESD flooring throughout the Production area, and a large configurable Training classroom."

The new building included space for future expansion. And Delta will now be taking advantage of this expansion space to meet needs driven by continued growth. The 2015 buildout includes eight new and remodeled offices, 1,000 square feet of additional warehouse space and nearly 1,200 square feet of expanded testing and training lab space for use by the several hundred people that get trained on Delta motion control products each year.

New Products

New products this month revolve around an updated controller portfolio for the process industries, a diagnostics tool that understands PROFIBUS PA, and switches with security for automation networks.



[Controller Portfolio Enhanced for Process Industry](#)

Siemens' first step was to give the Simatic S7-410 the standard coating for operation in toxic atmospheres and to further increase the fault tolerance of the redundant system. Siemens has also extended the ambient temperature range up to 70 degrees Celsius, which allows users to deploy the powerful Simatic PCS 7 controller in harsh environments, such as in oil and gas applications. The next steps will be, for example, to further expand the Profinet functionality in order to increase fault tolerance and availability.

[Read More...](#)



[PROFIBUS PA Capability added to Diagnostics Tool](#)

Softing's PROFIBUS Tester 5 now includes the new optional capability to test PROFIBUS PA installations.

- Specific signal analysis supporting MBP (Manchester Bus Powered) Physics (feeding voltage, signal deviation, signal polarity, bitrate divergence)
- Complete data analysis directly at PROFIBUS PA segment

[Read More...](#)



[Flexible Protection for Automation Networks](#)

The Scalance S615 is the latest addition to the Siemens security module product line. This cost-effective entry-level device from the Scalance S range protects industrial networks and automation systems against unauthorized access. The Scalance S615 security module has five Ethernet ports that offer protection for various network topologies via firewall or virtual private network.

[Read More...](#)
