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ISSUE 10

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Once again we get our teeth into a myth about PROFINET!
A compilation of previous 'debunks' is available [here](#).
[This conversation](#) is also worth reading

MYTH: PROFINET does not use TCP/IP!

RESPONSE: *That's news to us! TCP/IP is part of the internet 'suite' that all Industrial Ethernet solutions use and PROFINET is no exception. However, TCP/IP has severe limitations in the Real Time and high end Motion Control domains where time critical functionality is required. Any solution that depends on TCP/IP in these domains is forcing it to do things it was never intended for! Any TCP/IP based Real Time system, even a small one, is also prone to traffic overloads and network storms.*

PROFINET depends on TCP/IP a lot - but only for the tasks for which it was designed, e.g. enterprise connectivity and non-time critical functions such as parameterization or diagnostics. For Real Time, PROFINET by-passes TCP/IP to achieve far superior performance! For Isochronous Real Time (that's mainly Motion Control) it is enhanced still further by the use of an ASIC switch that is embedded in end devices and shares the Ethernet bandwidth.



*But it's important to remember that in both these time critical domains, full Ethernet compatibility is guaranteed!. So, TCP/IP functionality can be used simultaneously if desired. In the case of Motion Control, never less than 50% of the Ethernet bandwidth is available for TCP/IP-based transmissions! That's **at least 6MB** of data in tandem with up to 150 axes of Motion Control! TCP/IP based solutions cannot get anywhere near this!*

The ASIC also means external switches and point-to-point connections can be avoided and a multi-drop bus-like structure employed. Think of the benefits that brings!

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GENERAL ASSEMBLY BRINGS FOCUS ON FUTURE:

The 2006 PTO General Assembly meeting, held in Scottsdale in August, was memorable for its User Experience presentations (see later) as much as for the professionalism of its materials. More than 50 members and representatives attended to listen to the latest technical updates and the future strategy of the PTO and its mother organization, PI. Chairman Mike Bryant (above) opened proceedings with a look at progress, including a rapid-fire list of PTO statistics for the past 12 months: 8000 phone calls fielded; 250,000 air miles logged; the [PTO web site](#) has seen nearly 2,000,000 hits while the parent web site at www.profibus.com has seen 15,000,000 hits, roughly the same number as PROFIBUS devices installed. New Board Director Thad Frost was welcomed. On long term strategy Mike said that being market leader poses some challenges: "We must watch out for new technologies and paradigm shifts, and we must never forget that our competition is always biting at our heels," he said. "Complacency could be our biggest enemy." The broadening technical scope of the organization - now ranging from sensors to IT - means we have to adapt. "PROFIBUS will continue to be the most successful fieldbus ever," he said, going on to predict that 30,000,000 devices will be installed by 2011. "Nevertheless," he warned, "PROFIBUS growth will flatten so we must face those challenges now." He predicted a shakeout of Ethernet solutions within 5 years, with just 3 serious contenders remaining and said that PROFINET has moved from being a fieldbus technology to an 'automation technology', with all that entails. He concluded by announcing a new mission statement for PI, the international organization of which PTO is part: "We are and will remain the world's leading automation organization for communication solutions, serving our users, our members and the press with the best solutions, benefits and information." For more details and less formality visit the [PROFIblog for Day 1](#) and the [PROFIblog for Day 2](#). There are also referrals to news items and other blogs about the Meeting. There's even an experimental podcast by Carl Henning - check out his **PROFIcast** [here](#)

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USER EXPERIENCES IMPRESS AT GENERAL ASSEMBLY:

End user presentations at the PTO General Assembly covered applications in tobacco and, believe it or not, the theater. Michael Darnell (left) of system integrator and PTO member Prism Systems spoke enthusiastically about PROFINET's 'component based' capabilities, which were put to good use in a plant making hundreds of different cigar products. The plant is highly automated mechanically but lacked 'electrical' automation, so the owners had decided to bring things up to date and create a 'show place' for the industry, all to a tight time scale. The plant comprises many identical machines and was ideally suited to the component-based approach, whereby one functional module (it can be a machine, a fieldbus network or a single device) is defined as a 'component', placed in a computer library and then re-used as often as needed. Using simple click and drag techniques components are placed into an on-screen drawing and the communications paths are configured by simply joining up the inputs and outputs on-screen. This procedure saves huge amounts of engineering time and effort. The plant uses 21 PLCs, with extensive PROFIBUS and AS-Interface networks. The benefits, said Michael, are shown by simple mathematics: using conventional programming, it takes 80 hours to develop code for each machine and 4 hours to

replicate it for each other machine, resulting in over 300 hours of effort for the 63 machines in the plant, plus a modification time of 10 hours every time something has to be changed. Using the component-based approach, the code takes the same time but replication is reduced to minutes, giving a total of about 90 hours. Furthermore, each modification takes only minutes and only has to be performed once because it is automatically made available to all the others. Among the advantages are easier project management and the ability to test and prove programs off-site. The 4500 man-hour project was implemented in 5 months and showed a reduction of 20% in labor hours and 30% in labor costs. "With component-based PROFINET," said Michael, "we were able to 'eat the elephant' easily!"

Later, Jim Tomlinson (right) of the MGM Grand Hotel and Casino in Las Vegas fascinated the audience with a detailed explanation of the use of PROFIBUS in the Cirque du Soleil show "KA." The show involves non-stop action, both on stage and front of house, with complex motion of stage parts and flying apparatus. 32 PLCs, 186 drives and 206 coordinated axes of motion are involved. Safety is tightly integrated via PROFIsafe. Once begun, the show rarely stops even if a major problem develops ... "we just slow it down a bit until things come back on track," said Jim, brilliantly demonstrating this when his PC gave an unexpected 'low-battery' alarm: Jim's presentation did not falter as he grappled to connect his power lead under the desk! 12 months advance testing of the KA system took place at a Canadian base before the show was set up in Las Vegas. This user experience was a stunning demonstration of the power of PROFIBUS and we hope to bring you a more detailed case study shortly.

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SIEMENS/EMERSON CO-OPERATION WELCOMED: The PTO has welcomed the joint announcement by Emerson Process Management and Siemens Automation and Drives that both companies are exchanging technology and providing each other with engineering support. Siemens will be adding interfaces to its SIMATIC PCS 7 process control system and Process Device Manager (PDM) tool to support FOUNDATION Fieldbus (FF) standards in addition to the PROFIBUS and HART standards they support today. Emerson will be similarly expanding its Delta V and Ovation control systems as well as its AMS Suite with an interface for PROFIBUS DP and PROFINET in addition to the FOUNDATION Fieldbus and HART standards. PI Chairman Edgar Kuester said that the development is especially important for PROFINET and PROFIBUS DP, particularly in view of the global process automation market in which the American company Emerson plays an outstanding role, as it provides an ideal starting point for further disseminating open technologies. In addition, collaboration will serve to speed up the use of open technologies, expand the compatibility of automation products and thus provide the customer with greater functionality. It will also give PROFIBUS and PROFINET an ideal opportunity to demonstrate their greatest asset, namely closely-coupled implementation in both continuous and discrete automation processes. It's in 'hybrid' applications that the fieldbus combination of PROFIBUS DP and PA offers an especially decisive advantage. PI will continue to develop its own technologies under one roof. For PROFINET, work will continue on the communication-specific requirements of process automation within the newly-founded 'DCS Requirements' working group and the findings will influence the PROFINET specifications. PI member companies will continue to consolidate the market position of PROFIBUS PA above all in connection with PROFINET." Read the press releases [here](#) and [here](#)

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PROFINET DEVELOPER WORKSHOP: The PTO has announced a free PROFINET Developer Workshop on October 5, 2006 at the Hyatt Regency O'Hare in Chicago, IL. The workshop will provide potential PROFINET developers with a wide range of technical information including PROFINET vendor presentations to help them select the best tools to develop their PROFINET products, and is designed for device developers, development managers and product marketers. During the workshop, the ARC Advisory Group will provide a market overview and industry expert Harry Forbes will speak about the explosive growth of Industrial Ethernet. The PTO will give an overview on PROFINET and the PROFI Interface Center will provide a high-level look at various applications and the types of tools available to address them. Presentations will also be given by seven development tool providers who will each talk about their specific PROFINET development tools. Providers will also be available at exhibit tables for more detailed discussions. Exhibitors include: Hilscher North America, Inc., HMS Industrial Networks, Inc., Real Time Automation, Siemens Energy & Automation, Softing North America, Grid Connect, Inc. and Woodhead Industries. The PROFINET Developer Workshop follows the 3rd International Industrial Ethernet Symposium being held October 3-4 in Chicago. To register, visit www.us.profibus.com or call 480-483-2456.

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THERE'S STILL TIME TO ATTEND A FREE TRAINING CLASS: Want to know more about PROFIBUS? Want to know more about PROFINET? Want to know why you should use a fieldbus of any kind? A recent ARC Advisory Group survey revealed that one of the major factors inhibiting adoption of a fieldbus was "lack of knowledge." Remedy that by attending one of the free classes offered by PTO and the PROFI Interface Center. There are still a few of each class type remaining. There are no sales pitches but you can visit with the exhibiting vendors during breaks, lunch, and after the class at the hosted bar. If you register early you'll be eligible for an onsite raffle for a \$25 gift card. We hope to see you in San Francisco, Richmond, Minneapolis, St. Louis, Calgary, Los Angeles, Denver or Seattle. And remember to watch the website for [possible additions](#) to the scheduled cities, or [visit our North American events page](#). For up-to-the-minute reports on these classes as they happen, visit the [PROFIblog](#).

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ETHERNET SYMPOSIUM FOR CHICAGO, OCTOBER: The Third International Ethernet Symposium is slated for October 3-4 at the Westin Michigan Avenue Hotel in downtown Chicago. This is the first time it will be held in the US, having been previously hosted in Berlin and Amsterdam. The event will be moderated by David Humphrey, Senior Analyst, ARC Advisory Group, and is expected to attract more than 300 participants from 20 countries. Collins Hemingway, former marketing director of Microsoft and best-selling author, will provide the keynote. The symposium will include two days of workshops covering best practice examples of Ethernet in automation and feature presentations from a wide variety of industry and technology experts, industry analysts and 'best practice' customer case histories. Alongside will be a 'Micro-fair' with interactive exhibits of the latest Industrial Ethernet technology. Organized by Siemens, participation and presentation opportunities are nevertheless open to all industrial Ethernet organizations, including competitors. panelists from five industrial Ethernet consortia will present their views and answer questions from the moderator and the audience. Registration and additional details are available [here](#).



(An additional Flash presentation follows below ... if you cannot see it, please install a Flash plug-in to your browser.)

TECHNOLOGY UPDATE

HIGH SPEED MEDIA REDUNDANCY FOR PROFINET: The PROFIBUS Nutzerorganisation (PNO) in Germany has concluded a licensing agreement with Hirschmann and Siemens - co-owners of the rapid-recovery redundancy technologies for Ethernet known respectively as HSR and HiPER-Ring - to sub-license the technology to PNO member companies. The sub-license covers PROFINET Controllers (e.g. PLCs) or PROFINET field devices with integrated Controller Functionality having Redundancy Manager status. Products with a Redundancy Client are granted a free license. The deal is significant not just because it is the first to provide a real time media redundancy service for PROFINET networks (conventional Rapid Spanning Tree is already available), but because of its relevance for automation realtime. The basic HSR/ HiPER-Ring technology delivers 200-300ms recovery time (an order of magnitude faster than RST) which is suitable for PROFINET's TCP/IP activity. If ERTEC 200 or 400 chips are used in controller and field devices together with Isochronous Real Time (IRT), recovery times of microseconds can be achieved in motion control applications. The solution is the first to be submitted to IEC as a Publically Available Specification (PAS). The redundancy functionality will be part of IEC 61158-5/6. In Class 2 applications, as defined by the SC65C committee which is currently considering how to standardize Industrial Ethernet redundancy, it can provide recovery times in the millisecond range, sufficient for normal automation realtime. For PROFINET Class 1 applications, recovery times in the microsecond range are possible. The licensing conditions are only available to members of the PNO Germany at present. However, under the IEC's 'reasonable and non-discriminatory' requirements, other vendors can negotiate separate agreements with Hirschmann and Siemens.

'LABDEVICES' MARKETING STARTED AT ACHEMA: The new PROFIBUS device profile 'Lab Devices' is being specified especially to allow seamless integration of laboratories into PROFIBUS networks or, by means of OPC, also into other automation worlds. The LabDevices profile is currently being worked out. The profile was presented to the public the first time at the Achema fair (Frankfurt, Germany) in May 2006. Information was provided at the PI exhibition booth as well as at the booth of the DIN Technical Committee Laboratory Devices through information boards and an information flyer. Information was also available from several device manufacturers (Julabo, Lauda, Sartorius) who participated in the relevant TC 3 working group. Included in the information was the function block approach (see right) which makes the new profile similar to the existing 'PA Devices' profile. However, three function blocks (Human Interface, Ramp and Lab Control Unit) have been specifically developed for the LabDevices profile. Contacts were established with potential users and device manufacturers. The responses confirmed the trend towards increased automation in laboratories and showed a positive reaction to the trendsetting activity of PI in specifying the new profile. But it became also evident that the introduction of fieldbus technology into laboratories will take more time compared with factory or process automation. Marketing of the new profile will be continued the next months. Large chemical and pharmaceutical companies and some key manufacturers - including those of LIM systems - will be addressed.

QUESTIONS ANSWERED: There's a lively [Forum for technical questions](http://www.profibus.com) at www.profibus.com. Samples of recent discussions include:

- Q: Is there a PROFINET network with a ring structure? Are there any limitations regarding distance?
 - A: One of the advantages of PROFINET is that it enables the creation of flexible network structures. The length, speed and topology depend on the network components you choose for your network. For example, in case of fiber optic with integrated interfaces you can reach up to 300m between devices. With external components, fiber optic distances of up to 26km are possible, depending on the type of fiber optic being used and the vendor. In an electrical network the maximum distance between any two devices is 100m.
- Q: Is it possible to connect a standard Fast Ethernet Device (let's say, for example a Fast Ethernet Controller which supports TCP/IP) to a PROFINET network? I do not need Real Time support on these devices but I'd like to hang some standard Ethernet devices on a PROFINET network. Does a PROFINET Switch handle this? Is there something special to be taken care of?
 - A: You can connect a standard TCP/IP device into PROFINET: this device can't support real time communication because it hasn't been supported by the PROFINET protocol. Any standard TCP/IP device can connect to PROFINET.
- Q: I am new to PROFIBUS. Can a slave be implemented using a micro-controller and RS-485 circuitry? Can anyone suggest a step by step approach to developing a slave device.
 - A1: For PROFIBUS-Slave-Devices you have to implement a uC communicating with additional SLAVE-ASIC (SPC3 or VPC3+C) and a physical connection to the PROFIBUS Network by optical isolated RS485 Line Driver. PROFIBUS Communication is based on the firmware you need for one of the ASICs above.
 - A2: Search with Google for 'FE-TP-0405.pdf'. This article from Prof. Max Felser will give you an idea what you can do.

Go to the [online Forum](#)

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IN BRIEF

AROUND THE WORLD: **China:** PROFINEWS 49 and 50 have been published in Chinese and are available online [here](#). **Brazil:** Cesar Cassiolato (pictured) is the new President of Association PROFIBUS Brazil. Cassiolato is from Smar. Among his aims are the expansion of RPA membership and making RPA Brazil the best known Brazilian association for fieldbus protocols. He also intends to form the first PICC (Competence Centre) in Latin America. **UK:** More than 100 delegates and speakers gathered at Coombe Abbey (right) in June to attend the third PROFIBUS UK International Conference, which this year focused on end user issues. Hands-on 'primers' and the case studies presented by users such as AstraZeneca and Thamesport were in the program. The papers can be [downloaded here](#). A similar Conference will take place around the same time in 2007 and probably at the same location. **JAPAN:** PROFIBUS Days were held in Tokyo, Osaka and Kita-Kyushu in July, with over 240 delegates attending. JPO and six member companies made presentations covering the advantages of PROFIBUS and PROFINET (including PROFIsafe, etc), with application examples and demonstration of both systems.

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APPLICATIONS

FRANCE/ CHEMICALS: CLARIANT, a fluortelomers company from Gendorf, underwent extensive modernization and interfaced a first section of its plant to a process control system. CLARIANT, which specializes in pre-treatment and finishing chemicals, decided to work with a remote I/O technology system called Excom, developed and manufactured by TURCK. The decision to opt for Remote I/O in an Ex area was based on the long-standing experience with TURCK and their excellent commercial and technical support. The technical advantages of the system include: availability, power and gateway redundancy, longer periods without interruption, decentralized periphery system structure based on PROFIBUS DP-V1 functionality. The Excom system is space saving due to elimination of the need for multiple control cabinets. Up to 128 binary or 64 analogue intrinsically safe channels can be transferred via a single bus address. It also offers installation in Zone 1 for connection of signals from Zone 0, and hot exchanges. By working with Excom, CLARIANT has reduced its planning, installation and maintenance costs by more than 23% and reduced future installation costs by 30% to 40%. Excom, in Ex area with PROFIBUS DP-V1 functionality, was implemented within 3 weeks. Contact: Jim Petersen on 800-544-7769 x7325

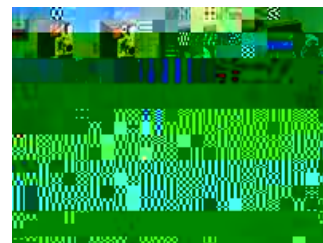
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NEW PRODUCTS

SYSTEM ON CHIP: Hilscher North America has released netX; a System on Chip (SoC) for industrial networking connectivity. netX can be a Master or Slave for PROFINET (Real Time & Isochronous Real Time) and PROFIBUS. It has built-in peripherals and can interface to virtually any network physical layer and protocol. netX 500 offers four communication channels, two which may be Ethernet or fieldbus, and the remainder fieldbus. The two Ethernet Channels are interconnected with switch or hub functionality. Development tools and kits are available. [Hilscher](#)



COMPACT I/O: Lumberg has introduced Lion compact I/O modules for PROFIBUS DP applications. It has two housing styles. Features include universal I/O functionality, expanded diagnostics, a diagnostic LED, optimized spacing between ports, flexible mounting options and an Innovative un-potted design which makes it possible to achieve the same shock and vibration resistance that was until now only possible with potted modules, resulting in lower weight. [Lumberg](#)



USB ADAPTER: The BradCommunications PROFIBUS USB adapter provides the tools to quickly and easily create a reliable connection between and PROFIBUS devices. PROFIBUS DP Master/Slave DP-V0 Class 1 & 2 and DP Master DP-V1 Class 1 & 2 are supported. FDT specification 1.2 is also supported and with baud rates of up to 12Mbps it's possible to use the adapter for control, configuration, set parameters, diagnose and trouble-shoot. [Woodhead](#).

BLOCK I/O: Designed for industrial in-cabinet use, the IP20 BradControl Block I/O system is an effective way to connect industrial I/O devices to a PLC or PC controller over an industrial network. Standard DIN rail mounting makes it convenient to install and adds flexibility to the design. Legends and LED indicators provide for easy setup and operational validation. The system comprises a network adapter and up to 32 expansion modules. Up to 512 channels of I/O are supported. [Woodhead](#)

ANALYZER UPDATE: ProfiTrace, the USB PROFIBUS analyzer, now supports the recently defined I&M functions for DP-V1 and PA devices and also has an improved PROFIBUS PA measurement algorithm for the PA-Probe. A free update can be downloaded from [Procentec](#). The analyzer is an essential tool for troubleshooting, maintenance and commissioning. It's claimed to eliminate downtime and increase plant availability and is distributed in USA by [Grid Connect](#)

NEW VERSION TOOL: A new version of the CBA Engineering Tool iMap for configuration of machine-machine communication offers significantly improved ease of use. For example, users in large projects benefit from a much clearer navigation with the new 'plan view'. An important feature is the capability to display several technological functions on a single device. iMap V3.0 also offers greatly improved flexibility: in addition to the activation and deactivation of individual functions, it is easy to copy entire plant sections. It's also multi-lingual. [Siemens](#)

COMMANDING PROFINET: ProfinetCommander runs as a PROFINET IO controller on a PC allowing engineers, maintenance personnel, integrators and developers to test and build a PROFINET network quickly and without PLC programming. The user can view the configuration, I/O data, parameters, alarms, and diagnostic data, and change the output data to the IO devices. This permits simple test and setup of a PROFINET IO Device or system before putting it into production, or in the case of device faults or alarm conditions. For developers, the added benefits are simple testing for correct operation and diagnostic function prior to certification and final product release. [More here](#)

PROFIBUS IO: Ci-800DP Series Fieldbus devices offer application specific Remote I/O such as Remote Process Cluster transmitters, Remote Thermocouple Cluster transmitters, & Remote Digital I/O. Each has a basic compact I/O module with an integrated PROFIBUS DP Slave port. The Remote Process Cluster transmitter is an 8 channel Universal Analog input module for migrating from Analog transmitters to a fieldbus-based system. The Remote Thermocouple cluster transmitter scans and converts sensor signals for PROFIBUS DP. The Remote Digital I/O system is a compact I/O module for discrete devices. All modules are software configurable and expandable. [Canopus](#)

PROFIBUS TEMPERATURE: Ascon Corporation is pleased to introduce the DeltaDue temperature modules with optional DX DIN rail mount PROFIBUS Gateway Manager. The DX module can store a backup copy of all connected DeltaDue module configurations and operator parameters. All DeltaDue modules feature "hot swap" capability and true single loop integrity. Thus, when a replacement DeltaDue module is inserted in the system, the DX module can instantly download all configuration and operator parameters to the new module without operator or engineer intervention. Also, the DX module provides a selectable Fieldbus output and allows for the connection of multiple Master devices to the system. [Ascon Corporation](#) or [more here](#)

CUSTOMIZED TRAINING: Automation Training has just added a 2 Day PROFIBUS DP course to its offerings. This course is available on Siemens Step 7 as well as AB-ControlLogix Woodhead's SST communications networks. Upon completion, the student shall be able to describe the function and

capabilities of PROFIBUS, Install simple networks including interface modules, software and cables, configure Remote IO, apply some communication blocks, and troubleshoot and repair PROFIBUS networks. [Automation Training](#)

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AND FINALLY?

AFTER PROFiblog, WHAT NEXT? Why **PROFicast** of course! PTO Deputy Director Carl Henning has just experimented with a Podcast of his PROFiblog material from the General Assembly meeting. If you're wondering how to keep up to date with PTO matters, then PROFicast may be just the thing. Save time by downloading it and listening in the car. Check out the [blog here](#), and the [podcast here](#).

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