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PI Network

50 MILLION PROFIBUS TARGET FOR 2012

PI is now confident that by 2012, 50 million PROFIBUS devices will be installed.

The prediction by Jörg Freitag was made during a major press conference held at the SPS/IPC/Drives fair in Nuremberg, November 2008.

Freitag also reported on developments such as the enhancement of PROFINET's performance in line networks when small data telegrams are being transmitted. This often occurs in motion control and fast IO applications and is a key segment of the industrial market - see story below for more.

Other topics included the 10th



anniversary of PROFIsafe, and a number of key introductions including a PROFIsafe starter kit - see page 2 for more on these and other PROFIsafe announcements.

Freitag said that the 'Excellence in Automation' conference scheduled for March 11-12, 2009 at the ZKM (Center for Art and Media) in Karlsruhe, Germany, will cover topics ranging from PROFIBUS, PROFINET, and IO-Link to

ENHANCING PROFINET IN LINE NETWORKS



PI experts are pushing the limits of Ethernet to enhance the performance of PROFINET for the kind of short frame transmissions typically found in motion control and fast IO applications. The solution is fully compatible with the IEEE802.3 Ethernet specification and does not jeopardize the openness of PROFINET or compatibility with existing PROFIBUS devices and networks.

The step mainly targets the communication needs of drives and fast IO in linear networks and will become an optional 'performance' extra that can be deployed when needed. It means that the performance of PROFINET comfortably exceeds that of all other Industrial Ethernet solutions right across the application spectrum.

A demonstration at the recent SPS/IPC/Drives fair in Nuremberg Germany showed how the solution works. Two methodologies are employed: the first - Dynamic Frame Packing (DFP) - allows the nodes in a line network to exchange frames that become shorter and shorter as they pass through subsequent nodes. The second - Fast Forwarding

safety and wireless to device integration, diagnostics, and asset management. Attendees can choose from a variety of parallel sessions. An international program committee chaired by Prof. Dr. Peter Neumann, is now developing a selection of papers for the conference, which is oriented towards end users as well as manufacturers, system integrators, and OEMs. Students may attend free of charge. **MORE INFORMATION HERE**



- ensures a short transit time near the technical limit of Ethernet, without compromising any of the openness of TCP/IP or PROFINET as deployed today.

PI Chairman Jörg Freitag said: "Complete compatibility with today's PROFINET devices is retained and existing devices will be fully interoperable with devices using the new 'fast' mechanisms. From the user's perspective nothing changes."

PROFINET is already the most powerful Industrial Ethernet solution in the tree and branch networks commonly found in today's automation systems.

About 1.1 million PROFINET devices were installed by the end of 2007.

PROFIsafe News



Wolfgang Stripf, the 'father' of PROFIsafe shows off his 'product wall' at the SPS/IPC/Drives fair in Nuremberg in November

80% GROWTH IN 2008

PI expects PROFIsafe's installed base to grow by 80% in 2008. At the end of 2007 there were 410,000 devices installed. The success of PROFIsafe is based on three paradigm shifts that bring significant cost savings.

1. It is possible to implement safety functions on PROFIBUS or PROFINET in almost identical ways. Independent safety-related hardware wiring can be eliminated.
2. PROFIsafe pioneered the so-called 'black channel' principle which allows secure transmission from end point to end point via proprietary backplane buses as well as PROFIBUS and PROFINET.

3. It enables the use of integrated safety functions in devices such as drives, thereby increasing flexibility during manufacturing as a result of parameterizable safety. It also achieves higher availability based on immediate startup after an emergency stop or when a warning occurs.

PROFIsafe is the only safety technology covering discrete, process and motion control. It is already well established in the all these markets.

DESIGNERS WORKSHOP

The next PROFIsafe training days are on February 10 – 12, 2009, in Karlsruhe. They will be held in English.

The 3-day course is for designers, developers, test engineers and safety assessors, and is organized by PNO Germany together with TÜV-Süd. The course includes a written test at the end of each day. Experts having passed all tests will receive a TÜV certificate 'Certified PROFIsafe Designer'.

The course has been developed in cooperation with TÜV, and is available to all PI members. PI has mandated that the training



Another view of the PROFIsafe 'product wall' at SPS/IPC/Drives in Nuremberg.

course shall be repeated every second year in order to continuously keep a Certified Engineer's knowledge up-to-date. **MORE INFORMATION.**

CHINESE DESCRIPTION

The PROFIsafe System Description is now available in Chinese! The Description provides a thorough insight into PROFIsafe technology without getting too much into details. The objective is not to replace standards or official specifications and guidelines, but

to introduce the technology and help readers gain an overview on its benefits. It is already available in English, German and Swedish. **DOWNLOAD THE CHINESE VERSION HERE.**

F-HOST CERTIFICATION

Certification of PROFIBUS DP slaves and PROFINET IO devices has been established for 5 years. Now, PI is providing certification for safety-related hosts (F-Hosts).

PROFIsafe hosts must hold a PROFIBUS or PROFINET certificate for the controller in which the PROFIsafe host is integrated (basic test). The PROFIsafe host test itself, which

is approved by TÜV, is virtually an automated test performed at accredited test laboratories.

The advantages to the user are obvious: When products with a PROFIsafe certificate are deployed, the residual error probability in data transmission is no longer of concern because this has already been proven generally for all proper implementations of PROFIsafe. In addition, all deterministic error models (e.g., delays in data transmission or repetition of safety-related frames) have been proven.

STARTER KIT

With the new PROFIsafe starter kit from PI, access to the PROFIsafe world for members couldn't be simpler. Version 3.4 reflects the present status of the PROFIsafe profile Version 2.4 and IEC 61784-3-3. It contains a few important add-ons for engineering. In addition, it satisfies a range of user requests, such as multi-instance capability and variable process data during runtime.

Besides all PROFIBUS and PROFINET specifications, the starter kit contains the source files for the so called PROFIsafe driver software (PSD) and a detailed implementation manual in English and German. It also provides several CRC (cyclic redundancy check) tools and aids for creation of GSD files with safety-related parameters. Sample adaptations of the PSD for commonly used stacks are provided and special monitors allow the PROFIsafe protocol sequences to be observed in slow motion.

A completely new feature is the support for the iPar-Server (option for storage and reload of individual safety parameters) and the Tool Calling Interface (TCI).

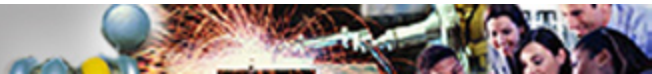
The CD-ROM contains example applications for both PROFIBUS and PROFINET that guide the user step-by-step in getting started with PROFIsafe.

More at the **PROFIsafe WEB PAGE**

and

PROFIsafe WEB SITE.





New Products

EMBEDDED IO

HMS has introduced an Anybus-IC interface for PROFINET IO. The new module is certified and comes in a housing measuring 9cm² containing all hardware and software. It reduces the development effort needed to design a communication interface by up to 70%, says HMS. Space and power supply requirements are minimized so that even small devices such as barcode readers or motor starters can be economically equipped with PROFINET. **HMS**



CONTROLLogix DP

The SST PLC communication module provides the interface required for a Rockwell Automation ControlLogix PLC controller to connect to PROFIBUS as a master or slave or emulate PROFIBUS DP I/O. New features provide users with increased performance and quicker startups by eliminating ladder logic programming. The module also supports Add-On Profiles for integration using RSLogix 5000 software, and Remote Link Library functionality. **MOLEX**

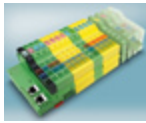


PROFIsafe IN ZONE 1

The IS1 remote I/O system now supports PROFIsafe in Zone 1 applications. IS1 is the first remote I/O system to allow for safe process shutdown via the fieldbus in SIL2 applications in hazardous areas. The system has analog input modules for SIL2-compliant communication via PROFIsafe over PROFIBUS. A digital output module allows for shutdown of all outputs via a separate Ex i input. The system is HART transparent, even in SIL networks, which enables the use of HART-based asset management functions. All IS1 modules are hot swappable within zone 1. Additionally, they can fulfil high availability requirements through redundant line and/or component installation. **STAHL**

PROFIsafe INLINE

PROFIsafe can now be flexibly integrated into automation systems based on Inline I/O modules. Depending on the bus coupler, PROFIsafe modules can be used in PROFIBUS DP or PROFINET networks. They also support the Interbus safety protocol. The modules allow up to eight safe sensors and/or safe actuators to be connected. The settings allow users to configure one or two channels of peripheral devices. **PHOENIX CONTACT**



AVAGO OPTOS

Avago has launched new digital optocouplers that support 3.3V/5V supply voltages, for use at speeds up to 15Mbs. The ACPL-071L/M75L/W70L (single channel) and ACPL 074L/K73L (dual channel) devices integrate a feature similar to under-voltage lock-out to prevent output disruption in case of power supply loss. **AVAGO**

SPUR REPEATER

The new ProfiHub C5 is designed for even rougher and demanding repeater applications. The ProfiHub family is a collection of popular PROFIBUS DP network components that enable long spur lines and backbone structures with star/tree segments. They contain 5 isolated repeater channels which individually handle a maximum of 31 devices and a cable length equal to the main bus. ProfiHub C5 distinguishes itself with its double metal housing and hybrid power + PROFIBUS connectors. **PROCENTEC**



WEB MONITORING

The diagnostics unit xEPI 2 enables continuous, parallel monitoring of a large number of PROFIBUS networks from anywhere and at anytime via a web browser. Malfunctions or

anomalies in the PROFIBUS network are automatically identified and displayed, or can be reported to the user via email alert. With no special client software or licensing required, all these functions are quickly and easily available. **TREBING+HIMSTEDT**



MARQUEE

The Uni Marquee is a marquee sign that communicates with any PLC via PROFIBUS to display alarms, machine performance or production data. Data can also be collected in real time through a built-in web server. The Marquee allows the user to configure and broadcast PLC data and message information without programming communication blocks. Setup is done with a web browser using Exor's Designer software. **EXOR**

DIAGNOSTICS UPDATE

Softing has enhanced its PROFIBUS Protocol Analyzer to concurrently analyze PROFIBUS DP (RS485) and PROFIBUS PA (MBP) networks without need for additional hardware components. It can also display diagnostic frames in clear text. Meanwhile, Softing's PROFIBUS Electrical Tester PB-T3 automatically analyzes communication problems without need for an oscilloscope. It's the only tool able to determine a PROFIBUS DP topology, says Softing, so it can pinpoint trouble-spots. It also displays the average signal level with minimum and maximum deviations. **SOFTING**



SINGLE CHIP FOR IO-LINK

NEC Electronics (Europe) has teamed up with chip company ELMOS and TMG to offer a Development Kit for IO-LINK sensors based on a single chip. An interim kit includes discrete components and the full single chip solution is expected in early 2009. ELMOS has designed the analog circuitry while TMG is providing the protocol stack. IO-LINK is a sensor level connection system which interfaces with PROFIBUS and PROFINET networks easily. **NEC**

Member News

CERTIFIED IN GERMANY

PROCENTEC, which has trained more than 400 Certified PROFIBUS Engineers worldwide, is establishing 'Certified PROFIBUS Engineer' courses in Germany. The first one will be in February 2009 in Karlsruhe. The course involves an intensive hands-on and theoretical 4-day training program. After passing an exam, the attendee gains the title 'Certified Engineer'. The course is intended for everyone who has to understand the theoretical and practical aspects of PROFIBUS. A "Certified PROFIBUS Installer" course will be held in Karlsruhe in April. **PROCENTEC**



BEFORE, WE WERE BLIND...

Agilicom, who recently delivered a PROFIBUS training course to a client in France, had this comment back from the company: "This training allowed us to acquire the competence for keeping our PROFIBUS installations working properly. We now are able to diagnose networks properly and therefore to immediately solve problems. We can also make an audit of our networks in order to anticipate communication problems. Before, we were blind; now we can see and understand! Powerful tools and high quality training will save huge and instant amounts of money for our company." Further training courses are scheduled. **AGILICOM**

MORE PRODUCTS ON-LINE

Our ON-LINE PRODUCT GUIDE has over 2500 product entries. Search on keywords, text or profile.



Applications

KOREA / WATER: Korea Water Resource Corporation (K-Water) has selected PROFIBUS as its standard fieldbus.

It previously investigated all available fieldbuses, to compare their specifications and the level of support from vendors. Technical consulting and working level committees were set up to consider the options and PROFIBUS was chosen because it is the leading fieldbus based on an open standard, with a wide range of products, vendors and applications, plus worldwide support.

With recent demands for open competition and standardization in the water industry, cost savings have become an important issue. However, conventional hard wired I/O systems for remote

control cannot avoid unnecessary complexities, which increase installation and maintenance costs year by year.

It was to overcome these difficulties that K-Water implemented PROFIBUS in its Filtration plant, thereby slimming the entire automation system and saving 30% in installation costs alone.

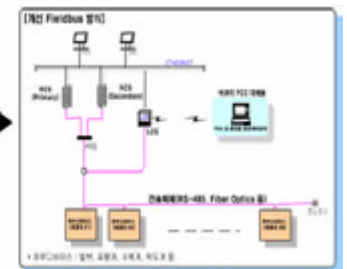
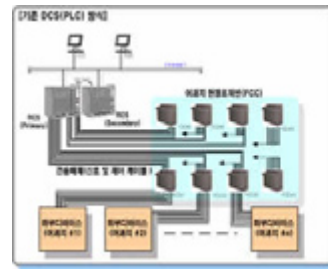
The filtration process comprises several filter beds, each bed including motor valves (inlet, outlet, reverse washing, surface washing, way-out and drain valves) with local instruments (level and turbidity). The conventional RCS - which included a hard-wired Filter Control Console (FCC) for local operation - was replaced by the much slimmer PROFIBUS system with a Local Operator's Station (LOS). This led to cost



savings through the removal of the ineffective FCC and its repeated hard-wiring problems. The diagrams bottom left illustrate the total extent of the slimming down process.

systems for even more reliable control.

At present, the system is configured with PROFIBUS using serial communications. However,



The PROFIBUS system enabled a customized PROFICAPTAIN unit from PROCENEC to be used.

During normal operations, the LOS is operated as an HMI. If the RCS encounters problems, or local operation is necessary, the LOS can control local devices directly over PROFIBUS.

By connecting the LOS through a wireless mobile PC, operators can also monitor measurements and work directly in front of field devices such as actuators and meters (top right).

Currently, K-Water is expanding its PROFIBUS applications to include water sourcing, pressurising, total filtration, diverging points, and supply plants.

From 2009, K-Water plans to apply redundant PROFIBUS

K-Water is now considering the use of PROFINET as an alternative once sufficient devices and components are available from Korean suppliers. **KOREA PROFIBUS ASSOCIATION:** chays@profibus.co.kr



SLIMMER INDEED! Comparative photos, showing how (top rows) the older plant equipment and cabling have been replaced by PROFIBUS-based equivalents (bottom rows), saving space, time and cost.



DO YOU HAVE A STORY TO TELL ABOUT PROFIBUS OR PROFINET?

Then why not submit it to PROFINEWS today? Case Studies in this newsletter show the world how PI technologies are helping automation users, and stimulating business success. Send to geoff@ggh.co.uk and/or petra.mayer@profibus.com.



Applications

POLAND / CONCRETE

PRODUCTS: ELTUR-WAPORE, based in the south western part of Poland, is a manufacturer of concrete products such as bricks, paving slabs, etc.

Their production line is divided into a series of stations, as shown in the diagram below. These include:

- > a station for preparing raw materials
- > a forming station
- > a drying room
- > a final line, which includes packaging and preparation for dispatch.

Between stations, raw materials and finished products are transported via conveyers. There are also some moving trolleys. Production is fully automated, with no staff involved.

Each station works independently but there is a common control system, plus a critical safety system and emergency shut down



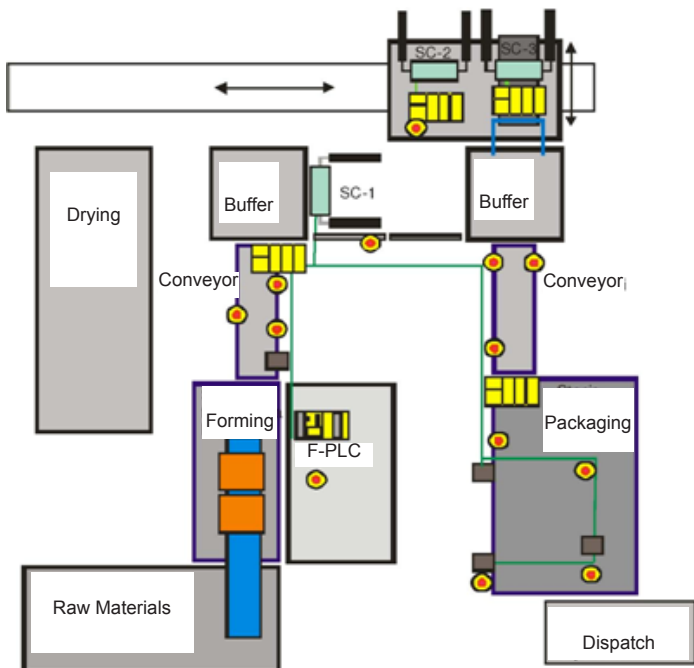
for the whole line.

Traditional emergency shut down systems were deemed too complicated so it was decided that a better solution would be to use SIMATIC F-PLC and PROFINET with PROFIsafe.

The local PLC controls the main parts of line via PROFINET modules and, using specially implemented safety functions, PROFIsafe secures its own part of line and send signals to the next



PLCs in line with any 'emergency status signals to avoid collisions in



an emergency.

The other advantage of the system is that it provides the possibility to control and secure the moving elements via wireless modules. SCALANCE wireless access points and clients are used, again based on PROFINET with PROFIsafe on WiFi.

Emergency signals are

communicated from the local F-I/O via radio to the F-PLC.

Everything is monitored and controlled from the control room using WinCC. The result? A safety system for emergency shut down, radio for wireless connection – and a highly automation production system as a complete solution. **SIEMENS**

NORWAY/ SHIP CONTROL:

The Ulstein group, part of the Norwegian Ulstein Mekaniske Verksted Holding AS, is involved in ship construction and control systems. Their main business is building ships for servicing drilling platforms, as well as multi-purpose ships that are equipped with the Ulstein IAS automation system manufactured and integrated by Ulstein Elektro AS.

The core of the solution in the Bourbon Mistral (pictured above right) consists of automation components from Phoenix Contact based on PROFINET.

The 'brain' is an Inline Controller ILC 390 PN 2TX-IB with interfaces to Ethernet and PROFINET-based 'nerve' systems.

The redundant, modular automation architecture is capable of controlling all on-board systems, including freight, ballast, energy distribution, alarm and monitoring functions, water, heating, air conditioning, air, pumps and winches. Rapid Spanning Tree Protocol and Fast Ring Detection is used to ensure backup switchover of less than 500ms.

"We consider the Ulstein IAS to be a breakthrough in ship automation", says Ulstein employee Geir Haddal. "The system is simple to operate and



The Bourbon Mistral built by Ulstein is the first ship to use the new Ulstein IAS automation system based on PROFINET.

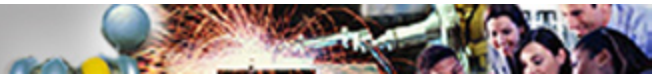
has been optimized for cost-efficient integration into ships."

The software is based on the PC Worx engineering tool, so Ulstein can develop its own software modules which can then be adapted to customer requirements quickly and easily.

"By using PROFINET, Ulstein IAS becomes highly flexible and easily scalable", declares Ulstein's Trond Liavaag. "A further advantage is its modular setup, enabling efficient control of processes. In addition the system is capable of processing large amounts of data at a very high speed." **PHOENIX CONTACT**



Geir Haddal (left) and Trond Liavaag developed the Ulstein IAS ship automation system, together with their team.



Tech Update

IMPLEMENTING PROFINET IRT

Three steps are sufficient

Synchronous applications can be easily implemented with the PROFINET IRT protocol. With just a few additions to the system, an isochronous, low-jitter data exchange can be implemented via Industrial Ethernet interfaces even for simple real-time applications: with a PROFINET-capable device and an intermediate driver.

Because of its dominant position in the office world and in industrial applications, the Ethernet interface is especially important. Most intelligent devices used for automation therefore have an Industrial Ethernet connection for this reason. This standard is also suitable for small, individual applications, as Ethernet is very often the common denominator of a cost-effective implementation. An asynchronous data exchange is then possible.

However, what is the situation with the cyclic data exchange when this task is not performed by an automation system such as SIMATIC or SIMOTION.

PROFINET IRT protocol provides high determinism

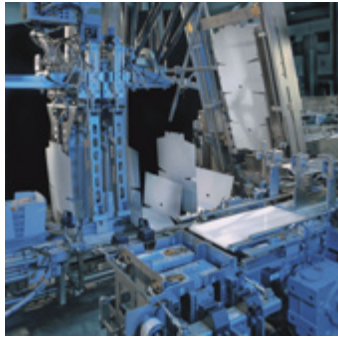
In this case, an alternative is provided by the use of the PROFINET IRT (Isochronous Real-time) protocol. This synchronizes the communication of all connected devices in a precisely maintained clock cycle, in which the read and write operations of all devices are performed. This reduces the maximum jitter during the

acquisition of an asynchronously occurring event to the length of a basic cycle. In this way, the reproducibility of the processes is improved by up to five times for the same cycle times.

For simple applications with a manageable number of communication nodes and where the demands on the performance are not too extreme, the setting up of a PROFINET IRT communication does not require many technical resources: one or two standard Industrial Ethernet interfaces that have to be reserved exclusively for the PROFINET IRT application and a hardware device equipped with the IRT technology. This takes over the role of the master in a communication topology set up according to the master-slave principle.

Definition of the topology

Three basic steps are required to set up a real-time-capable PROFINET communication system. The device that is to be the master and which is to organize the cyclic communication in the application is defined in the first step. In principle, any PROFINET-capable device is suitable for this, for example, a drive of the Sinamics S120 series with an interface for PROFINET. All other devices are slaves. The master ensures that the sequence of the send and receive operations specified by the PROFINET protocol is maintained. It thus prevents



PROFINET with IRT is perfect for applications with precise cycle times, such as packaging machines

collisions of datagrams – an essential precondition for the required high determinism of the communication.

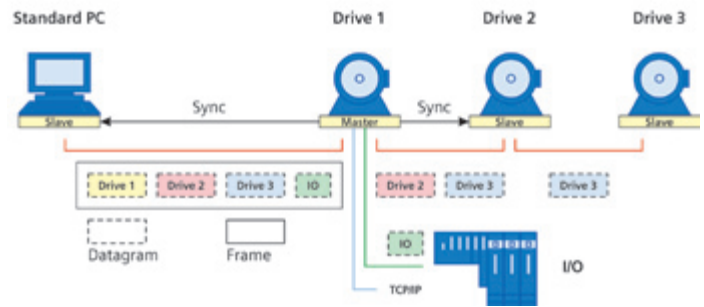
Precondition: suitable driver

In the second step, the correct preconditions must be created

for the real-time processing on the driver side. Under Windows and most Linux operating systems, the standard drivers of the network interface only support asynchronous data traffic. In order that the application software can access the transferred process image directly and without delay, the real-time data must be filtered out of the data

in the third step. For a simple application, the process image of an application can be considered as a unit in each cycle. The distribution of the components of the process image defined for the individual communication peers must be specified for this. The software required to perform this task must be installed on the device with the master function.

In the output direction, the device with the longest path is addressed first in every cycle. In the input direction, the communication peer with the shortest path transmits first, followed by the others. The configuration of the communication and the protocols from the controlling PC is performed via the asynchronous communication. Basic PROFINET protocols that can also be used independently of the IP-based operation are defined for this.



Drive 1 coordinates the communication as master, serves as gateway to an I/O system and can be used as interface to a LAN (Local Area Network)

traffic of the Industrial Ethernet interface, or channeled in. A simple way to perform this is provided by the Network Driver Interface Specification (NDIS) of Windows. It enables access between the protocol implementations on the operating system and the driver of the Industrial Ethernet block.

Only a hardware-independent NDIS intermediate driver is required for this. It extracts the real-time information of the PROFINET IRT protocol from the incoming data of the respective interface, clocks the user program and sends the data issued by the user program in the response datagram of the IRT cycle.

Parameterization of the synchronous communication

The parameterization is performed

Engineering system for high-performance PROFINET communication

Uniform components that are equipped for PROFINET IRT operation are required to fully utilize the performance capability of the PROFINET IRT protocol. PROFINET with IRT is available in automation systems, in which isochronous real-time communication is provided as a system service of the engineering tools and the device firmware. In this way, the use of the PROFINET protocol in the machine and plant construction as well as in industrial applications becomes cost-effective and technically just as attractive as for simple applications on a small scale. **SIEMENS**

IDENTICAL PROFILE FOR PROFIBUS AND PROFINET

As of Version 4, PROFIdrive also supports Ethernet-based communication in the form of PROFINET. On the user program side, the profile is identical for PROFIBUS and PROFINET. Therefore, applications created for PROFIBUS can also be used with PROFINET without any changes to the profile interface – and vice versa. This enables the machine manufacturer to react more quickly, easily and with significantly reduced development costs to the demands of the market or individual customers. PROFIdrive is now also specified as an international standard since the publication of IEC 61800-7.

PI World

JAPAN

The Japanese PROFIBUS Organization (JPO) began their series of independent seminars and demonstrations three years ago. The event was named 'PROFIBUS Day 2008' this year, and held in Tokyo in October. A total of 130 people attended. In the seminar sessions, Softing, Hilscher Japan, HMS, Endress Hauser Japan, Auma Japan, Siemens and JPO explained PROFIBUS & PROFINET developments, also applications and latest technologies. Open PROFIBUS and PROFINET demonstrations - including products from 18 JPO members - were shown. The 18 JPO members also showed their capabilities on their own tabletops. JPO believes this type of event is a good introduction for PROFIBUS and PROFINET. A 'PROFIBUS Day 2009' is now under preparation. japan@profibus.com

KOREA

'Industrial Ethernet PROFINET today



and future' was the title of a seminar held in Seoul in September. More than 250 persons attended - 100 more than expected! The event was hosted by the Korea PROFIBUS Association (KPA). The opening presentation by Jörg Freitag, PI Chairman, and Cha Young-Sik, Chairman of KPA, was followed by presentations about PROFINET (RT/IO and CBA/IRT) and the benefits of PROFINET. In the afternoon, PROFINET products were presented and the application possibilities were explained. Afterwards, participants were shown PROFINET multi-vendor devices running together in a demo system. Sponsors of the event were



SOUTH EAST ASIA

A new board committee for PROFIBUS South-East-Asia was elected during the Annual General Meeting held on October 31, 2008. The new members are (left to right above): President: Dominique Chabauty (TURCK Singapore Pte Ltd); Treasurer: Raymond Ng (Belden Singapore Pte Ltd); Secretary: Volker Schulz (Siemens); Marketing Committee: David Chia (Siemens); Technical Committee Team Leader: Arasu Thanigai (Pepperl + Fuchs); Member: Vidyut Gandhi (Softing); Senior Advisor: Mr. Henk Schaake (TURCK Singapore Pte Ltd). Vice-President Jack Van Der Horst (ABB) is not pictured; southeastasia@profibus.com

Siemens, Phoenix Contact, Mahani (for Wago and Balluff), Crevis, Harting, Rittal, Weidmüller, and BIA (for HMS). During a press conference which took place in parallel with the seminar the CEOs of these companies gave brief speeches about PROFINET. The magazines FA Journal, Complete Automation, Automation Technology, CONTROL, C&I, Process Control and ICN attended. For Jörg Freitag, the new PI Chairman, the event was a great opportunity to visit PROFINET end-users, manufacturers and universities in Korea and to get a personal impression of the situation there. He was impressed by the great interest of Korean industry in PROFINET, which was underlined by the large number of attendees at the seminar: 30% were end users from the automotive and heavy industries, 40% were system integrators and 15% were device vendors. korea@profibus.com

USA

PTO now has 144 members, the highest number for many years. Said Executive Director Mike Bryant: "The number of companies interested in PROFIBUS and PROFINET seems to be entering a new phase. Whereas a few years ago PROFIBUS was not taken that seriously in North America, today we've raised our credibility to match or even exceed our main competitor. There's also massive interest from both vendor and end user communities in our Industrial Ethernet solution PROFINET and I am now confident that PROFINET will be as successful here as in Europe in coming years." North American one-day training classes for 2008 concluded recently. 2008 saw over 2,100 registrants from 900 companies in 24 separate classes in 23 cities. There

were 6 'PROFIBUS in the Process Industries' classes; 8 PROFIBUS; and 10 PROFINET. If you missed PTO in 2008, watch the **PTO web site** for the 2009 schedule. If you can't wait until next year, view the **archived webinars** for coverage of Industrial Ethernet, PROFINET, wireless, and PROFIBUS in the Process Industries. Certified Network Engineer classes have also proved successful: over 100 Certified PROFIBUS and PROFINET Engineers have been added this year in North America. If you are interested in attending one of PTO's educational events, then **this web site** will keep you up to date. Watch **here** for updates on the one day training classes. To be kept informed automatically of future events use **this RSS feed** to stay up to date. (**This page** will tell you more about RSS).

NOTE: The PTO's Carl Henning blogged extensively from the SPS/IPC/Drives Fair in Nuremberg. Find his series of reports, including *exclusive film footage*, **here**.

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