PROFINEWS

ISSUE 47

DECEMBER 2005

PROFIBUS PROCESS FIELD BUS

in this issue

Official Newsletter of PROFIBUS International www.profibus.com

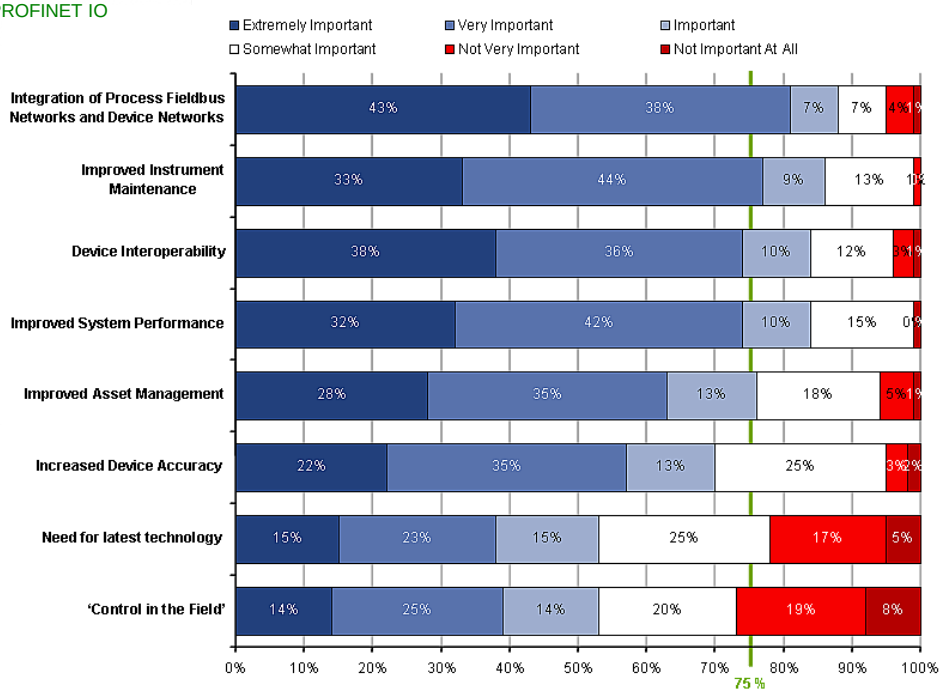
CONTENTS

88% SAY TIGHTLY INTEGRATED AUTOMATION NETWORKS ARE THE PRIORITY IN PROCESS

Market analyst ARC's just-released 2005 fieldbus survey shows conclusively that 'control in the field' is NOT the most important fieldbus attribute!

The survey took data from over 200 process fieldbus users from across the globe - with more or less equal contributions from Europe and North America, and a well-balanced sample from across the process industries. What the survey reveals is that confidence in fieldbuses has grown substantially in the 2 years since the last survey was done, and that fieldbuses as a whole are now used widely, even in mission critical applications. This is an important step forward for all fieldbuses, said PROFIBUS International chairman Edgar Küster, pictured left speaking at a press conference at the recent SPS/IPC/DRIVES show in Nuremberg, Germany.

In terms of return on investment, more and more users find that using fieldbuses is profitable. Such experiences have increased considerably in the past two years. Approx. 27% of users see a return on investment within the first six months and 18% within the next six months. 61% said they are directly planning new fieldbus systems.



ARC REPORTS ON 'ALL-ENCOMPASSING' PROFINET

Market analyst ARC has published a white paper on PROFINET. In it PROFINET is described as an 'all-encompassing' solution for Industrial Ethernet that protects existing investments, incorporates safety and drives technology, provides a graphical way to configure and engineer systems and opens the door to high performance motion control. Five PROFINET case studies are included, from industries as diverse as tobacco, automotive, horticulture, waste water and filling machines. This report is required reading for all automation engineers. Get it from www.profinet.com.

The survey also reveals that 88% of respondents think that closely-coupled process and discrete automation networks are 'extremely important', 'important' or 'very important'. PROFIBUS was designed specifically for this hybrid need, says Küster, "and our DP and PA solutions fit the need perfectly."

Added Küster: "What's also interesting is the trend in the number of people who think 'control in the field' is not so important. In 2003 it was 9%, today it's 23%. This suggests that it's increasingly seen as a nice-to-have feature whose cost and complexity outweigh its practicality."

PI NEWS

PROFIdrive VERSION 4

At the SPS/IPC/DRIVES 2005, PI showed a clock synchronous application of the PROFIdrive profile under PROFINET with IRT (Isochronous Real Time).

Version 4.0 of the PROFIdrive profile, released in September 2005, has created a standard profile for drives that can be used with both PROFIBUS and PROFINET.

The PROFIdrive profile has been mapped on PROFINET while maintaining the same user interface. The separation of application and communication makes it possible for manufacturers and users to easily use PROFIdrive applications on PROFIBUS or PROFINET.

The profile describes the drive interface from the point of view of the control application, along with its mapping on the communication system. Six application classes are covered.

The profile remains unchanged from the previous PROFIBUS-only version.

The application classes defined in PROFIdrive encompass both simple applications as well as high-performance synchronous applications. The clock synchronous operation of several distributed devices of a motion control application is an elementary requirement for a modern drive profile. This significantly influences the quality of motion control systems, particularly when synchronizing movements in connection with electronic gears, for example.

PROFIdrive profile V4.0 is currently being inserted into IEC 61800-7 in the ongoing standardization activities for drive interfaces.

PI DEMONSTRATES LATEST SAFETY AND DRIVES TECHNOLOGY

PROFIsafe VERSION 2

PROFIsafe created in its profile version 2 a new 'V2-mode' for safe communication across PROFIBUS and PROFINET. It is compatible with the earlier 'V1-mode' that runs on PROFIBUS networks solely.

A demonstration of the new version was given at the SPS/IPC/DRIVES event. First PROFINET devices with PROFIsafe were shown.

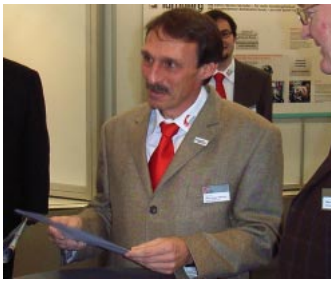
PROFIsafe allows for coexistence of standard and safe communications on one cable, plus the ability to integrate it with PROFIdrive, something that is not possible in non bus-based systems. The safety layer is independent of the communication channel and encompasses e.g. PLC and Remote I/O backplane buses. The 'V2-mode' of PROFIsafe takes into account the special properties of Ethernet networks, such as the expanded address space and active network components, such as switches.

The goal was to create a common safe communication profile for use in all markets, including motion control, discrete and continuous manufacturing, burner management, cable cars and similar.

PROFIsafe can be used for safety applications up to category 4 or SIL3. A positive concept assessment for Version 2 is available from TÜV and, soon, from BGIA. A 'PROFIsafe driver software for safety devices' is available and certified by TÜV thus facilitating development efforts.

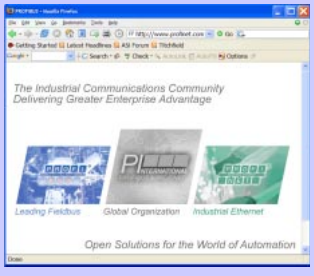
PROFIsafe is currently going to be standardized internationally within IEC 61784-3.

PROFINET IO CERTIFICATE GOES TO netX



Hilscher Automation's netX chip for PROFINET IO has been successfully certified. The certificate was handed over by PNO's managing director Dr. Volker Oestreich to Mr. Jürgen Hilscher (above) at SPS/IPC/DRIVES. netX is a next generation Network Controller for Real-time Ethernet and Fieldbus systems and comes complete with two Ethernet ports. For more product details please go to page 4.

NEW WEB PORTAL LAUNCHED AT WWW.PROFINET.COM



PI has created a substantial new Web presence at www.profinet.com. The portal offers three color-coded 'access points' for finding out about PROFIBUS, PROFINET and the organization behind both technologies PI.

For a transitional period, the old web site will remain at www.profibus.com

The site has a contemporary design and uses a simple intuitive structure that allows easy navigation, with context-sensitive menu structures making it easier to find information, regardless of type. PROFINEWS will be re-designed in 2006 to reflect the style and content of the new web presence. Watch for our first issue in February 2006.

ITALY/ PAINT SHOP

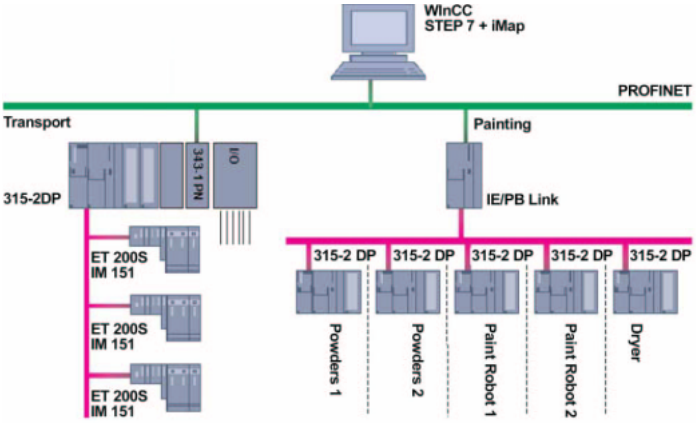
A well-known washing machine manufacturer is taking advantage of PROFINET with Component Based Automation and PROFIBUS to produce colored washing machines.

Although washing machines are typically 'white' goods, consumer preferences are changing. 5% of machines sold today are other than white, and it is assumed this trend will grow.

To produce metal housings, the Electrolux Company implemented a technologically advanced paint shop at its factory in Porcia, Italy, the largest production plant for washing machines and dryers in Europe. The automation system was planned and converted using PROFINET with Component Based Automation, which splits plant functions into 'components' regardless of communications, enabling a graphical approach to be used for configuration that dramatically simplifies the engineering phases.

The paint shop is based around a monorail airlift system on which the half-shells for the washing machines travel from the load station to the drying ovens.

From the load station, the half-shells are transported to a painting cubicle, where a robot covers them with colored powder. They then dry in a polymerization oven after going through a paint cubicle in which the fixing agents and burnishing compounds are applied. Finally, they are placed in the appropriate drying oven. At the end of the cycle, the halfshells are taken to the unloading station.



Each function is designed as an intelligent unit which performs its task and communicates with other modules over a network. This is an ideal model for Component Based Automation.

A PROFINET-capable Simatic S7-300 functions as coordinator and is also responsible for the transport system, which includes three PROFIBUS networks connected to ET200 IO modules. This is one 'component' of the CBA system.

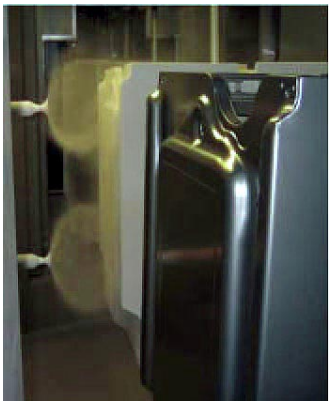
Five additional S7-300 control the two painting cubicles, the two painting robots and the drying ovens. Again, PROFIBUS is used at the local level and each 'module' is a component in its own right.

The coordinating PLC also communicates with the visualization system and the factory management system from which it receives work instructions. It also updates the management system in real time with production data.

"The integration of PROFINET in the paint shop simplified data interchange between the plant sections as well as visualization, and also paved the way for problem-free integration in the company intranet", says Vincenzo Peresson, responsible for system integration. "All signals having to do with the paint shop are exchanged over PROFINET, the signals for the transport system as well as the signals between the programmable controllers. The PROFIBUS devices are fully integrated for transparency. This makes it possible to reprogram operations from a central location, and gives us access in real time from any location to all operational information."

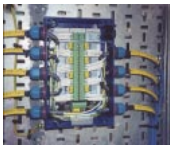
The data which the intelligent components exchange (e.g. start belt, stop belt, start painting process and so on) are defined as 'components' by constructing simple graphical circuit diagrams with iMap configuration software. This allows flexible configuration of the communication links during commissioning, and when the plant is expanded.

Peresson confirms this: "Thanks to the iMap engineering tool, we were able to save a great deal of time. For example, it is no longer necessary to use a communication specialist. All one has to do is follow the iMap and that's it, regardless of network type or physical topology. Modularization also allows us to modify an intelligent module internally without having to intervene in the programming or in the operation of the other modules. This, in turn, gives us enormous flexibility in the development of the plant by permitting us to hang on to the investments we already made."



PRODUCT NEWS

DEVICE COUPLERS



MooreHawke device couplers are based on IP66 field enclosures, complete with cable glands to suit field wiring. The company's TRUNKGUARD units provide 'second generation' attributes such as automatic segment termination for 4, 8, 10, or 20 PROFIBUS PA devices. **Moore Industries International: +1 818 894 7111 or www.miinet.com**

DRIVES ENGINEERING

Based on the functionality of the acyclic PROFIdrive parameter channel TrioDrive D/PS and MidiDrive D/PS servo drives are ideal for drive engineering, say the makers. An OPC driver supports the PROFIdrive profile server and also allows direct access to DP-V1. With PROFIBUS interface boards and Ethernet/PROFIBUS gateways from multiple suppliers these servo drives and engineering software offer maximum flexibility. **ESR Pollmeier: +49 6167 9306 0 or info@esr-pollmeier.de or www.esr-pollmeier.de**

CABLE VALIDATION

ProfiPulse is a low cost tool to assist with the validation of PROFIBUS DP cable and can verify if the cable is suitable for the required transmission speed. After selecting a baud rate the software generates I/O pulses using the ProfiCore communications processor. With an external oscilloscope the user can examine the signal shapes. **PROFIBUS Center Netherlands: www.profibuscenter.nl/profipulse**

LINEAR BUS

Siemens has introduced two new ET200S IO interface modules, each featuring an integrated two port switch that allows the establishment of PROFINET linear bus structures. This simulates the 'multi-drop, single cable' aspect of fieldbuses and eliminates the need for external switches. It also means that star or branch connections can be avoided. **Siemens: www.siemens.de/et200S**

PROFINET STACK

Softing has announced its PROFINET I/O controller protocol software stack. As Softing says: "How about equipping your PLC, CNC, robot control or specific process control with a PROFINET interface? Or enhancing your PC-based control or visualization tool with this enhanced technology? All you need is a protocol stack which can be adapted to the environments easily. These are the requirements fulfilled by our PROFINET I/O controller protocol software." Solutions for IO Device and IO Supervisor will follow. **Softing: +49 89 456 56 363 or gerd.schneider@softing.com or www.softing.com**

PROFINET COUPLER

The Anybus Communicator can drop the cost of connection to PROFINET to Euro20. It connects devices via their serial ports to PROFINET networks. Typical applications are barcode or RFID scanners, weigh scales, frequency inverters and motor starters. The Communicator is DIN rail mounted and acts as a PROFINET IO device. RS-232, RS-485 and RS-422 signal are supported. Using RS-485, up to 31 devices can be connected, appearing as a group in PROFINET and reducing the cost of connection. **HMS Industrial Networks: +49-721-96472–0 or info@hms-networks.de**

AROUND THE WORLD (1)

USA

The current free seminar series across North America drew to a close recently with a final PROFIBUS DP seminar in Salt Lake City. This year's program has been a huge success attracting thousands of attendees in 29 cities. Now, the 2006 schedule is being planned, with a different style of event envisaged. Since PROFIBUS's main competition comes not from other fieldbuses but from non-fieldbus users, the 2006 courses will include more basic information for newcomers, with unbiassed inclusion of other fieldbuses and how they compare with PROFIBUS. Details of training courses are available at **www.us.profibus.com**. At ISA EXPO in Chicago, a PROFINET Wall, highlighting connectivity for Interbus, DeviceNet, AS-Interface and PROFIBUS was the main feature of the PTO Booth. Booth participants included: ASCO Valve, Automation Direct, Eaton Electrical, Endress + Hauser, Grid Connect, Hilscher, HMS, MESCO Engineering, Moore Industries, Network Vision, ProSoft Technology, Real Time Automation, Siemens, Softing, Turck and WAGO. **Contact: usa@profibus.com**

UK

The PROFIBUS User Group carried out an online survey to find out what delegates to the 2006 PROFIBUS User Conference want to hear. One of the results is that more 'Back to Basics' course are planned, to make it easy for people to transition to fieldbus systems. The Papers Committee are inviting submissions on single subjects, with papers including interactive sessions and live demos particularly welcome. Technology papers will present the latest developments in PROFIBUS and PROFINET. Visit www.profibus.co.uk for full details or email uk.profibus.com. Two Master Classes for potential developers PROFINET products were held in the UK during October, one hosted by Manchester Metropolitan University (UK Competence Centre) and one by Siemens A&D, attracting a total of 26 delegates. Presentations were by Manfred Popp, Director of the PROFINET Competence Centre at ComDeC, Fürth, Germany and topics included an overview of PROFINET IO and CBA, Performance Calculations, GSD files, IO Device Software and ERTEC 400/200 Development kits. **Contact: uk@profibus.com**

MORE PRODUCT NEWS

ARMING PROFINET

netX is a next generation Network Controller for linking real time PROFINET and Fieldbus. A 32 Bit ARM926 CPU is combined with two Ethernet channels including integrated PHYs, switch, HUB and IEEE 1588. The 200 MHz ARM CPU with integrated SDRAM, LCD controllers and analog inputs with PWM outputs enable its use for smart I/O, control applications and even low cost terminals. The integrated Dual-Port-Memory allows netX to be connected as a flexible network controller to a host CPU. **Hilscher: www.hilscher.com or +49 6190 9907 0**

SOUTHERN AFRICA

New Southern Africa committee Chairman Dieter Dilchert writes: "At our last AGM the PROFIBUS User Group elected a new Executive Committee for 2005/ 2006 - as follows:

- **Dieter Dilchert** Chairman / Event Management
- **Edwin Bauer** Vice Chairman
- **Rob McKenzie** Marketing
- **Piet Ferreira** Training
- **Tony Jacobsen** Finance
- **Steve Venter**

- **Kessi Coetzee** Secretary
- **Carin Barnard** Accounts
- **Dave Bean** Director PICC
- **Michael Bean** Training PICC

"On behalf of the PROFIBUS User Group, I would like to thank Tony Jacobsen for all his hard work in promoting PROFIBUS in Southern Africa. He attended many local and international meetings during his 3 year period as Chairman and in 2004 hosted the PROFIBUS PI meeting in Cape Town followed by an International PROFIBUS Conference and EXPO in Johannesburg. Tony will stay on the Executive Committee to assist."

On the 8 November 2005 a Technical Seminar was held at ABB Sunninghill.

New Southern Africa committee members. Left to right: Edwin Bauer, ABB, Rob McKenzie, Phoenix Contact, Tony Jacobsen, Endress+Hauser and Dieter Dilchert, Lapp Cable.

CHINA: HIGHLY SUCCESSFUL PROFIBUS & PROFINET ROADSHOWS DRAW TO A CLOSE

PI and the China PROFIBUS Organisation (CPO) have been co-hosting a series of road shows and seminars in 2005 in major cities.

The second part kicked off at the Hilton Hotel in Chongqing on Oct. 31. Located in the western part of China, Chongqing is the city with the most potential for investment in a strong industrial base. There are about 15,000 industrial enterprises in Chongqing. In 2004, the profit return in its industrial area reached 11,338 billion RMB, an increase of 37.8 percent. Chongqing has become one of the top ten bases in the country for the export of mechatronic products. It's well on its way to developing high-tech industries including information technology, biology and environmental protection, etc.

About 400 delegates took part in the two-day Chongqing seminar, where great interest was shown in both PROFIBUS and PROFINET, as well as in the presentations. Delegates came from fields such as industrial automation, automation control and industrial communications.

Participating companies included M-System, Harting, Phoenix Contact, Siemens, Weidmuller, E+H, who introduced PROFIBUS and PROFINET technologies and demonstrated products.

Mr. Edgar Küster, Chairman of PI, came from Germany to attend later meetings in Kungming and Guangzhou. His presentations were well received.

Kunming is the industrial and touring center in Chiba and its GDP went up to 40.2 billion RMB in 1996. Today, there are 68,000 industrial enterprises of which 1,000 are joint ventures. The annual total value of these companies amounts to 48 billion RMB, with imports and exports totalling US$84.52 million. Many large and medium sized enterprises including steel, tobacco manufacturers and chemical plants

are taking on a new look. There are about ten thousand enterprises in the rural areas with annual income totalling 28 billion RMB. In 1997 Kunming was ranked the fourteenth of fifty cities nationwide.

The two-day seminar in Kunming attracted more than 500 delegates from industries like tobacco, metallurgy, cement, chemistry and electronics. Seats were continuously being added due to the overwhelming number of participants.

A lively interaction with the audiences took place at the end of each day in each city, when experts from participating companies answered tough questions in a friendly atmosphere. Kunming is seen to be a place with great potential for the development and application of PROFINET technology in particular.

In Guangzhou, a press conference was also held, when Mr. Kuester updated editors on PROFIBUS and PROFINET developments. Mr. Li Baihuang , Chairman of CPO, Mr. Jiyang, Director of CPCC, Mr. Chen Haidong from Siemens, Mr. Müller, Manager of the Marketing Department of Phoenix Contact, Mr. Stephane Renaud, Marketing director manager of Harting attended this conference. Mr. Liu Yihua, General Secretary of Guangzhou Mechanical and Electrical Profession Association presided. **Contact: china@profibus.com**

AROUND THE WORLD (3)

NETHERLANDS

The Chinese PROFIBUS Competence Center and PROFIBUS Center Netherlands are organizing PROFIBUS Product Development training classes in Beijing. Dates are 10 - 12 January 2006. The training classes are intended for companies wanting to develop PROFIBUS DP and PA products. The protocol ASICs, software, schematics, GSD files and the certification process are thoroughly explained. **Contact: www.profibuscenter.nl/ppd**.

JAPAN

Japan PROFIBUS Organization (JPO) supported two exhibitions in November - the Measurement & Control show (mainly for process automation) and the System Control Fair (mainly for factory automation), both in Tokyo. 54,738 people visited the former, and 84,360 visited the latter. JPO showed a multi-PLC

connection demonstration, in which 5 major PLCs (Yokogawa, OMRON, Mitsubishi, Siemens and ABB) can each act as the master. 24 member companies supported the event by showing their products and demos. JPO also showed a PROFIBUS PA multi-vendor demo at Measurement & Control. Two members demonstrated PROFINET IO products at System Control. JPO now has 78 members and expects to reach 80 soon. SEMICON Japan will be attended in December. **Contact: www.profibus.jp or japan@profibus.com**

FRANCE

In September, France PROFIBUS attended the Automation show in Paris with a PROFIBUS Village!

More than 100 new PROFIBUS and PROFINET products were presented on the 300 square metre booth, France PROFIBUS has also published PROFIMAG 8, shown above. **Contact: france@profibus.com**

NORWAY

AD Elektronik AS, in cooperation with the PROFIBUS Center Netherlands, arranged their first certified installer and engineer training courses in October. The interest was overwhelming and both courses were over booked. 6 installers and 9 engineers were certified. Further courses are planned for February and June 2006. **Contact: www.ade.com or norway@profibus.com**

CZECH REPUBLIC

PROFINET is building a stronghold in the Czech Republic and Eastern Europe. ANF DATA, together with Siemens and its partners, organized a seminar called 'Future

technology in industrial automation - PROFINET' in November. This was followed by the accreditation of a PROFINET Competence Center at ANF DATA. A keynote presentation from Dr. Peter Wenzel, managing director of PI, covered PROFINET as a broad industrial standard and an opening presentation from Prof. Schiller from ITM explained important factors such as reliability and

safety. More than 50 international attendees from the automation industry, universities and partner companies got information about PROFINET and the existing services. The PROFINET Competence Center at ANF DATA provides complete services in the area of PROFINET product design, consulting, training, software development and expertise in industrial communication. **Contact: czechrepublic@profibus.com**

Dr Peter Wenzel (right) with Professor Frank Schiller of itm (left) and Vladimir Kulla, ANF Data (center)

REGIONAL ASSOCIATIONS

Australia - *Mr. Andrew Janiak*
Tel: +61 3 9761 5599; Fax: +61 3 9761 5525
Email: australia@PROFIBUS.com
www.aus.PROFIBUS.com

Belgium - *Mr. Herman Looghe*
Tel: +32 2 706 80 00; Fax: +32 2 706 80 09
Email: belgium@PROFIBUS.com
www.be.PROFIBUS.com

Brazil - *Mr. Paulo Camargo*
Tel: +55 11 3833 4958; Fax: +55 11 3833 4183
Email: brazil@PROFIBUS.com
www.br.PROFIBUS.com

China - *Mrs. Wang Jun*
Tel.: +86 10 62 02 92 18; Fax: +86 10 62 01 78 73
Email: china@PROFIBUS.com
www.cn.PROFIBUS.com

Czech Republic - *Mr. Zdenek Hanzalek*
Tel.: +420 2 2435 7610; Fax: +420 2 2435 7610
Email: czechrepublic@PROFIBUS.com
www.cz.PROFIBUS.com

Denmark - *Mr. Kim Husmer*
Tel.: +45 40 78 96 36; Fax:+45 44 07 77 36
Email: denmark@PROFIBUS.com
www.dk.PROFIBUS.com

Finland - *Mr. Taisto Kaijanen*
Tel: +35 8 9 5307259; Fax: +35 8 9 5307360
Email: finland@PROFIBUS.com
www.sf.PROFIBUS.com

France - *Mrs. Christiane Bigot*
Tel: +33 1 45 74 63 22; Fax: +33 1 45 74 03 33
Email: france@PROFIBUS.com
www.fr.PROFIBUS.com

Germany - *Mr. Peter Wenzel/Mr Volker Oestreich*
Tel: +49 721 96 58590; Fax: +49 721 96 58589
Email: germany@PROFIBUS.com
www.de.PROFIBUS.com

Ireland - *Mr. Hassan Kaghazchi*
Tel: +353 61 202 107; Fax: +353 61 202 582
Email: ireland@PROFIBUS.com
www.ir.PROFIBUS.com

Italy - *Mr. Maurizio Ghizzoni*
Tel: +39 030 3384030; Fax: +39 030 396999
Email: pni@PROFIBUS.com
www.it.PROFIBUS.com

Japan - *Mr. Shinichi Motoyoshi*
Tel: +81 3 54 23 86 28; Fax: +81 3 54 23 87 34
Email: japan@PROFIBUS.com
www.jp.PROFIBUS.com

Korea - *Mr. Qa Young Sik*
Tel: +82 2 523 5143; Fax: +82 2 523 5149
Email: korea@PROFIBUS.com
www.rk.PROFIBUS.com

Netherlands - *Mr Dolf van Eendenburg*
Tel: +31 33 469 0507; Fax: +31 33 461 6638
Email: netherlands@PROFIBUS.com
www.nl.PROFIBUS.com

Norway - *Mr. Kai Atle Myrvang*
Tel: +47 909 88640; Fax: +47 904 05509
Email: norway@PROFIBUS.com
www.no.PROFIBUS.com

Poland - *Mr. Dariusz Germanek*
Tel: +48 32 371365; Fax: +48 32 372680
Email: poland@PROFIBUS.com
www.PROFIBUS.com

Russia - *Mrs. Olga Sinenko*
Tel: +7 095 742 68 28; Fax: +7 095 742 68 29
Email: russia@PROFIBUS.com
www.rus.PROFIBUS.com

Slovakia - *Mr Richard Balogh*
Tel: +421 7 6029 1411, Fax: +421 2 6542 9051
Email: slovakia@PROFIBUS.com
www.sk.PROFIBUS.com

South-East Asia - *Mr. Volker Schulz*
Tel: +65 6490 6464; Fax: +65 6490 6465
Email: southeastasia@PROFIBUS.com
www.sea.PROFIBUS.com

Southern Africa - *Mr. Dieter Dilchert*
Tel: +27 11 201 3200: Fax:+27 11 609 5950
Email: southernafrica@PROFIBUS.com
www.rsa.PROFIBUS.com

Sweden - *Mr. Peter Bengtsson*
Tel: +46 4 51 49 460; Fax: + 46 4 51 89 833
Email: sweden@PROFIBUS.com
www.se.PROFIBUS.com

Switzerland - *Ms. Karin Beyeler*
Tel: +41 32 672 03 25; Fax: +41 32 672 03 26
Email: switzerland@PROFIBUS.com
www.ch.PROFIBUS.com

UK - *Mr. Bob Squirrell*
Tel/Fax: +44 845 456 3203
Email: uk@PROFIBUS.com
www.uk.PROFIBUS.com

USA & CANADA - *Mr. Michael Bryant*
Tel: +1 480 483 2456; Fax: +1 480 483 7202
Email: usa@PROFIBUS.com
www.us.PROFIBUS.com

Editor: Geoff Hodgkinson
1 West St, Titchfield, Hants, UK PO14 4DH.
Tel: +44 (0) 1329 846166; Fax: +44 (0) 1329 512063
geoff@ggh.co.uk

Published by: PROFIBUS International
Haid-und-Neu-Str. 7
D-76131 Karlsruhe, Germany