Open Solutions for the World of Automation
Practical Aspects of PROFIBUS & PROFINET in Factory Automation

Agenda

- Practical steps for a successful Profibus project  
  Derek Lane
- Introduction to Profinet  
  Andy Verwer
- Coffee
- Using Industrial Ethernet Networks for Profinet  
  Alan Bollard
- Lunch
- Commissioning & Maintenance - Fault Finding Demo  
  Andy Verwer
- Coffee
- Profinet Configuration – Incl. Profibus Integration and ProfiSafe  
  Peter Brown
- Summary and Next Steps  
  Bob Squirrell
- Close @ 3.30pm
Visits, Phones & Fires

The WRC Group

Emergency Procedure

If the fire alarm sounds please evacuate using the nearest fire exit which your host will point out to you.

Please report to Assembly Point 4 in the Visitors Car Park
Who is PI?

PROFIBUS & PROFINET International:
- 25 Regional PI Associations (RPA)
- 37 Competence Centers in 22 countries
- 12 PI Training Centers (PITC) in 9 countries
- 10 Test Labs in 6 countries
- >1,400 member companies worldwide
- >2,500 products
- 2 technologies: PROFIBUS + PROFINET

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Two Technologies – One Organisation

PI (PROFIBUS & PROFINET International)

Regional PI Associations | PI Competence Centers | PI Test Laboratories | PI Training Centers

Technologies

Fieldbus based Automation Technology

Ethernet based Automation Technology

Proxy Technology

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PROFIBUS Nodes

- In 2007: 4.5 Mio Nodes!
- In 2008: 5 Mio Nodes!
- Target: 50 Mio. by 2012

- PROFIBUS Nodes increased from 18.8 Mio. in 2007 to 31.4 Mio. in 2009.
- The number of PROFIBUS Nodes is projected to reach 50 Mio. by 2012.
PROFIBUS in Process Automation

Agenda
- PI Group
- Profibus
- Profinet
- Wireless
- IO–Link
- ProfiEnergy

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PROFIBUS PA Devices

<table>
<thead>
<tr>
<th>Year</th>
<th>Units</th>
</tr>
</thead>
<tbody>
<tr>
<td>2001</td>
<td>135.000</td>
</tr>
<tr>
<td>2002</td>
<td>205.000</td>
</tr>
<tr>
<td>2003</td>
<td>300.000</td>
</tr>
<tr>
<td>2004</td>
<td>400.000</td>
</tr>
<tr>
<td>2005</td>
<td>530.000</td>
</tr>
<tr>
<td>2006</td>
<td>630.000</td>
</tr>
<tr>
<td>2007</td>
<td>750.000</td>
</tr>
</tbody>
</table>

PROFIBUS Nodes in PA (Mio)

<table>
<thead>
<tr>
<th>Year</th>
<th>Mio</th>
</tr>
</thead>
<tbody>
<tr>
<td>2001</td>
<td>1.6</td>
</tr>
<tr>
<td>2002</td>
<td>2.1</td>
</tr>
<tr>
<td>2003</td>
<td>2.8</td>
</tr>
<tr>
<td>2004</td>
<td>3.3</td>
</tr>
<tr>
<td>2005</td>
<td>4.0</td>
</tr>
</tbody>
</table>

Graph showing growth from 2001 to 2007 with percentage increases marked:
- 2001: +52%
- 2002: +46%
- 2003: +33%
- 2004: +33%
- 2005: +19%
- 2006: +19%
- 2007: +18%

2009: 5.4 Mio
## Agenda

- PI Group
- Profibus
- Profinet
- Wireless
- IO–Link
- ProfiEnergy

### Practical Aspects of PROFIBUS & PROFINET in Factory Automation

#### PROFIsafe Nodes/Systems

<table>
<thead>
<tr>
<th>Year</th>
<th>PROFIsafe Nodes</th>
<th>PROFIsafe Systems</th>
</tr>
</thead>
<tbody>
<tr>
<td>2004</td>
<td>80,000</td>
<td>11,000</td>
</tr>
<tr>
<td>2005</td>
<td>137,000</td>
<td>16,000</td>
</tr>
<tr>
<td>2006</td>
<td>230,000</td>
<td>26,000</td>
</tr>
<tr>
<td>2007</td>
<td>410,000</td>
<td>41,000</td>
</tr>
<tr>
<td>2009</td>
<td>850,000</td>
<td></td>
</tr>
</tbody>
</table>

- PROFIsafe Nodes: +45% 2005, +68% 2006, +68% 2007, +78% 2009

*Note: The data reflects a growth trend from 2004 to 2009.*
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PROFINET: What is counted?

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PROFINET Nodes

PROFINET - The leading Industrial Ethernet System

Growth 31.25%

- 1.14 Mio.
- 1.6 Mio.
- 2.1 Mio.
- 3 Mio.

Time

- 2001
- 2002
- 2003
- 2004
- 2005
- 2006
- 2007
- 2008
- 2009
- 2010

PROFINET Nodes

1 Mio.

2 Mio.

3 Mio.

4 Mio.
Wireless Communication

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Wireless Communication

Field Level

Radio / Protocol:
- Wireless LAN 802.11.1 b&g

Sensor Level

Radio / Protocol:
- PA: 802.15.4 (Wireless HART)
- FA: 802.15.1 (Bluetooth, based on WISA)

Remote I/O WLAN

WSAN Gateway

Author / Title of the presentation
Practical Aspects of PROFIBUS & PROFINET in Factory Automation
With IO-Link, the ability to communicate extends over the entire automation environment.
IO-Link Consortium Members

Agenda
PI Group
Profibus
Profinet
Wireless
IO-Link
ProfiEnergy

Membership growth

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Further information can be found via Profibus website at link: [http://www.profibus.com/technology/io-link/](http://www.profibus.com/technology/io-link/)

Or direct at link: [http://www.io-link.com](http://www.io-link.com)
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Saving of Energy is Required everywhere

... Saving of energy in production?
Energy Consumption savings

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**Definition:**

PROFIenergy is a data interface based on PROFINET which permits coordinated and centrally controlled switching-off of loads in pauses independent of the vendor and device.
Fulfillment of the defined Use Cases and sites requirements on the following terms:

- Use of existing (communications-) mechanisms
- Independent Implementation
- Fast Realisation possible

First Release of the Energy Saving Profile “PROFIenergy” available to the market by Q3 of 2010
Companies represented on WG
Stratford Manor Hotel
Stratford-upon-Avon,
Tuesday 29th June &
Wednesday 30th June 2010

Full programme that will lead Users through PROFIBUS and PROFINET from the basic technology through to its use in real world industrial and process applications, plus an update on the latest developments in PROFIBUS and PROFINET. This two-day Conference features application-oriented technical sessions and hands-on workshops presented by technology experts, experienced users and systems builders drawn from a wide variety of application areas.

The event is supported by a free of charge exhibition with interactive displays and technology demonstrations from the UK's PROFIBUS Competence Centre and leading product vendors, trainers, consultants and systems integrators.
PROFINET Product Development Course, 5th May @ Manchester Metropolitan University

<table>
<thead>
<tr>
<th>Ethernet basics</th>
<th>PROFINET features and service</th>
</tr>
</thead>
<tbody>
<tr>
<td>PROFINET basics</td>
<td>Redundancy, topology display</td>
</tr>
<tr>
<td>Device model and addressing</td>
<td>PROFIsafe, iPar-Server, device replacement without engineering stations</td>
</tr>
<tr>
<td>From development to start-up</td>
<td>Development kit</td>
</tr>
<tr>
<td>PROFINET: unsynchronised communication</td>
<td>Questions, answers and discussions</td>
</tr>
<tr>
<td>PROFINET IO, RT classes, and UDP/IP communication</td>
<td>Other details</td>
</tr>
<tr>
<td>Data exchange, diagnosis and alarms</td>
<td>Duration: 1 day (9:15 am - 4:30 pm)</td>
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<tr>
<td>PROFINET: synchronised communication</td>
<td>Course Rate: £195 per person</td>
</tr>
<tr>
<td>Isochronous real-time</td>
<td>Course Date: 5th May 2010</td>
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<td>Static device description</td>
<td>Venue: Manchester Metropolitan University</td>
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<td>Parameterisation with TCI</td>
<td>Web: <a href="http://www.mmu.ac.uk/profibus">www.mmu.ac.uk/profibus</a></td>
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<td>Dynamic device description</td>
<td>Booking: <a href="mailto:admin@uk.profibus.com">admin@uk.profibus.com</a></td>
</tr>
<tr>
<td>Toll Calling Interface (TCI)</td>
<td></td>
</tr>
</tbody>
</table>

The details are online at: [http://www.sci-eng.mmu.ac.uk/ascent/training_courses/profinet_product_development/](http://www.sci-eng.mmu.ac.uk/ascent/training_courses/profinet_product_development/)

For more information please see Xiu Ji
The Industrial Communications Community 
Delivering Greater Enterprise Advantage

Leading Fieldbus  Global Organization  Industrial Ethernet

Open Solutions for the World of Automation

www.profibus.co.uk
www.profibus.com  www.profinet.com

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