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Open Solutions for the World of Automation

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Welcome to PROFIBUS

Fieldbuses are industrial networking systems developed to replace centralized parallel wiring and prevailing analog signal transmission. Today, communications increasingly occur horizontally at the field level as well as vertically through several hierarchical levels.

PROFIBUS is primarily used at the field level with interfacing capabilities downward to the sensor/actuator level as well as upwards to the production and enterprise levels.

PROFInet is the solution of PROFIBUS International for distributed automation systems, linking automation components using open, standardized technologies both vertically and horizontally around the plant. PROFIBUS segments can be linked to PROFInet via Proxies.

Before PROFIBUS

Machine or plant automation was based on a centralized system with individual connections to each field device (e.g. sensors and actuators). Assembly mistakes were easily made but not so easily solved.

Further, it wasn’t possible to set-up and maintain field devices centrally. Users had to go to each device in turn to change, for instance, its operating parameters.

At the beginning of PROFIBUS

The aim was to create a single-cable solution that could provide substantial cost reductions. Primarily, this was aimed at design, commissioning, engineering and system start-up. Goals included fewer drawings, easier cable assembly and faster system start-up.

Today

PROFIBUS is a powerful and versatile two-wire fieldbus system. The bus cable is installed around the machine or plant and field devices are connected to it, decreasing the number of drawings and reducing mistakes during assembly. PROFIBUS also brings benefits for operational phases, which helps reduce Total Cost of Ownership. Devices connected to PROFIBUS are ‘smart’. They deliver information about their ‘health’ and about the quality of the measured value. For example they can call for maintenance, thus preventing or reducing downtime.

PROFIBUS is applicable to every industry and application. If you are in process automation, PROFIBUS is the right choice; if you are in factory automation, PROFIBUS is the right choice; if you require safety or motion control, PROFIBUS again is the right choice.
Market Leader in Automation Technology

Automation with PROFIBUS means controlling a plant or machine from a master over a bus connecting all actuators and sensors. The bus consists of a two-wire copper cable or glass fibre to which standard PROFIBUS components are connected. The user can execute important actions at any location on the machine or installation: controlling processes, setting parameters, or carrying out diagnostics and maintenance. In addition, high accuracy is guaranteed since all parts of the PROFIBUS network operate digitally.

The success of PROFIBUS is unparalleled. About a million applications run using PROFIBUS. More than 2,500 products are available from internationally and locally recognized manufacturers.

PROFIBUS is a proven investment protected by its foundation in the international standards IEC61158 and IEC61784, technologically driven by the development force of our member companies, based on the know-how arising from almost a million applications, supported by more than 1,200 members of the PROFIBUS International (PI) user community.

The PROFIBUS implementation provides solutions for efficient communication between control systems and peripheral devices, is applicable and well established in all segments of the manufacturing and process industries, offers unified solutions for all parts of a production process, from upstream through mainstream to downstream, and from materials-in to goods-out logistics, from warehousing through manufacturing to packaging.

PROFIBUS comprises a uniform, modular structure, offering a standard but flexible approach for factory and production automation, including coupling of the field with higher level control systems. It provides certified quality through its extensive quality assurance concept whereby, on the basis of standardized test procedures, certificates are issued to devices that successfully passed the test.

PROFIBUS provides tailored solutions using application profiles PROFIBUS is able to meet even the most extreme application requirements, whether in a potentially explosive environment, for the identification of products, for advanced motion control, in continuous or batch process control, or many others.

PROFIBUS is unified. The same PROFIBUS protocol is used in all applications, combined with industry-specific application profiles and relevant transmission technology to meet differing requirements.

- PROFIBUS DP – optimized for factory automation
- PROFIBUS PA – optimized for process automation
- PROFIsafe – PROFIBUS for safety-related systems
- PROFIdrive – PROFIBUS for motion control
Solutions covering the entire Industrial Automation spectrum

**PROFIBUS DP**

**PROFIBUS in Factory Automation**

PROFIBUS Automation Technology provides rich benefits for almost any application in Factory Automation. Devices such as remote I/O, drives, ident systems, motor starters as well as weighing & dosing systems, human machine interfaces, energy-systems and so on are connected via a single cable. More than 2,500 PROFIBUS-compliant products are available from which you can select best-in-class devices to suit your individual needs, with alternative sources usually available. In all control environments a huge number of vendors support PROFIBUS.

**PROFIBUS PA**

**PROFIBUS in Process Automation**

PROFIBUS PA is a consistent fieldbus solution allowing vendor-independent operation of process devices on one bus. This interoperability is realized by the Application Profile PA. Devices which standardize the functional steps of the measured value from the raw signal of the sensor through to the pre-processed process value, for devices such as pressure and temperature transmitters, valves, actuators, analyzers and remote I/O units. Power over the bus is supported. PROFIBUS PA can also operate in potentially explosive areas using the MBP-IS transmission. Acyclic communications enable on-line parameterization, diagnostics and maintenance.

PROFIBUS is the only fieldbus which covers not only the batch and continuous processes but also the Upstream and Downstream discrete requirements.

**PROFIdrive**

**PROFIBUS in Motion Control**

In motion control applications decentralized automation structures can be realized economically because PROFIBUS permits the dynamic distribution of control signals amongst intelligent drives. Digital servo-drives can be synchronized via PROFIBUS and the position control loop can be closed over the bus, allowing demanding motion control applications to be met.

**PROFIsafe**

**PROFIBUS in Safety Applications**

PROFIsafe is the PROFIBUS solution supporting safety-related applications in both machine and process control. It is a high integrity communications solution realized by additional software. Failsafe and standard application tasks are handled simultaneously over the same bus, which means the advantages of standard PROFIBUS are always available. The technology is certified for use in applications up to SIL 3 (IEC 61508), AK 6 and KAT 4. The ‘PROFIsafe Policy’ of manufacturers and suppliers ensures compliance with a high standard of quality throughout all areas of development and implementation.
Unparalleled Benefits

The PROFIBUS community is led by PROFIBUS International (PI), which was established in 1995. PI today includes 24 Regional PROFIBUS Associations (RPA) around the world, having more than 1,200 members, including end-users, system integrators, commissioning-engineering-firms (CEF), contractors, machinebuilders, institutes, vendors, OEMs and distributors. Together, they form the largest fieldbus community worldwide!

PROFIBUS International is dedicated to ensuring the quality and continuity of PROFIBUS Automation Technology. Investment protection, openness, stability and reliability are the highest priorities at all times.

Designing a new manufacturing line? Automating a machine? Building a new plant or revamping existing units? Operating machines or performing maintenance?

PROFIBUS can provide you with optimal solutions, by:

- saving money and time during planning, installation, commissioning, operation, and maintenance of the installation.
- requiring much less space and fewer components.
- giving you the freedom to stay with your favorite suppliers or select products from new vendors.
- providing your maintenance engineers with a totally new sense of involvement through ‘talking’ to field devices over the bus from anywhere in your plant.

Your decision to use PROFIBUS will be one of your most profitable ever taken

- If you are responsible for a new automation investment, technically or financially, for engineering, operation or maintenance, for availability and efficiency, or for product quality: Choose PROFIBUS and you will realize your responsibility in the best possible way, because no other automation technology is more versatile!
- If you plan a major automation project but have to start with a first small step: Choose PROFIBUS, because no other automation technology provides better long-term continuity and investment protection!
- If you want to implement distributed automation structures for open communication in outstanding new plants: Choose PROFIBUS and gain access to Ethernet via the versatility of PROFInet!

PROFIBUS guarantees benefits for all

- End users will benefit from increased plant availability and efficiency, reduced life-cycle costs, optimized process control and best possible long-term product quality.
- System integrators, CEFs, and contractors will benefit from an open communication standard, an extensive range of compliant products, and a unified engineering technology. Another big advantage is the reusability of software-components.
- OEM companies will benefit from an open communications protocol and quality standards that are internationally accepted, with worldwide expertise, support and spare parts.

Your decision to use PROFIBUS will be one of your most profitable ever taken
References – industry wide, worldwide

PROFIBUS is an industry wide technology:

- automotive
- chemical
- food and beverage
- logistics
- machine building
- material handling
- metal processing
- mining
- oil & gas
- pharmaceuticals
- print & packaging
- pulp & paper
- ship building
- textile
- traffic
- water and waste water
- web presses

... and many, many more

Have a look at [www.profibus.com](http://www.profibus.com) to read many interesting case studies.