

PROFIBUS

Process automation with
digital fieldbus technology



PROFIBUS solves your application

A step ahead with digital communication

Process automation Digital communication is becoming more and more “state-of-the-art” technology in process automation. Based on the latest PROFIBUS Profile 3.02 software enhancements, users benefit from technical advantages and potential for cost savings, i.e.:

- Highest plant availability and reliability supported by the latest device diagnostics allowing predictive maintenance.
- Flexibility due to the availability of all important device variables and parameters.
- Complete transparency by accessing all parameters and diagnostic information for devices and process environment.

Endress+Hauser, as the know-how leader in PROFIBUS PA, was the first manufacturer introducing the Profile 3.02, which can reduce the life cycle cost of an instrument drastically.

i Perfect integration in automation systems:

Endress+Hauser field devices are released for use in all important process control systems and are therefore tested accordingly. The passing of thorough test procedures is mandatory prior to release.

In Endress+Hauser’s “System World”, additional application specific integration tests are performed with a wide variety of automation systems.

For more information on “System World” visit:
www.endress.com/systemworld

Your benefits

PROFIBUS provides digital communication via bus architecture and fulfils all the demands of modern automation systems. Not only will we help you with the perfect instruments, we also offer engineering, commissioning, trainings and services.

Higher economic efficiency

- Less space and components since fewer I/O cards, terminals, barriers and cables are required.
- Lower engineering costs because only one planning tool is required for all devices.
- Shorter plant commissioning, up to ten times faster downloads.
- Higher flexibility in production and hence improved plant productivity.

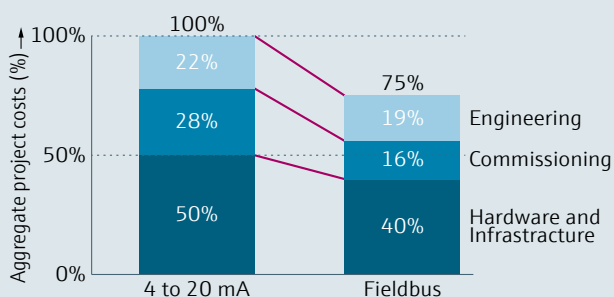
Openness with PROFIBUS

- The standard EN 50170/IEC 61158 provides a full, open, manufacturer-independent and stable basis for your fieldbus investments.
- Well proven with an installed base of over 47.4 million devices worldwide.
- PROFIBUS products are tested and certified in independent laboratories accredited by the PROFIBUS User Organization (PNO).

Increased safety and reliability

- Reduces down-times by increasing the availability of the plant.
- Supports predictive maintenance by providing reliable diagnostic data according to NAMUR NE 107.
- Allows devices to be easily exchanged, even across generations and during ongoing operations.
- Supports the use of devices in hazardous areas.

Cost savings through PROFIBUS



✓ Fieldbus savings:

Although fieldbus is often perceived to be more expensive than 4 to 20 mA technology, when the complete hardware and infrastructure is taken into account, typical savings in capital expenditure are around 10%. A 3% saving is contributed by Engineering, but the biggest reduction is the 12% in commissioning costs. As devices can be configured and loop-checks etc. can be performed from a central station, commissioning is accelerated and the plant can be started up significantly earlier than with 4 to 20 mA installations. This cost advantage exists throughout the life-time of the plant.

Software and hardware, a strong team in PROFIBUS

PROFIBUS communication features In order to read and write process data, e.g. measured values, status and other parameters, a PROFIBUS master is required. There are two ways of accessing data in a PROFIBUS device:

- Cyclic Communication
 - Cyclic exchange of process values and set points between the master and the sensors/actuators that are connected via PROFIBUS.
 - Data required for process management applications.
 - Every process value is delivered with an additional status information, which shows whether the value can be trusted.
- Acyclic Communication
 - Event driven communication to read parameters from or to write parameters to a PROFIBUS device.
 - Used for instrument adjustment and diagnostic readout.
 - Data required for engineering/asset management systems, e.g. FieldCare.






System Integration A PROFIBUS network is engineered by using the following files:

- General Station Description file (GSD)
 - Describes communication behavior and supported features of a PROFIBUS device.
 - Includes the format of Input/Output data that may be exchanged cyclically between the device and the master.
 - Provides diagnostic data as plain text.
- Electronic Device Description (EDD)
 - Used in parameterization or Plant Asset Management tools to setup the device.
 - Contains information on the device parameters.
- Device Type Manager (DTM) Software component for
 - Accessing specific field device functions via user interface.
 - Parameterization of device, diagnostics and maintenance.
 - Integration in Plant Asset Management (e.g. FieldCare) or control systems.
- Driver download at: www.endress.com/en/downloads

PROFIBUS PA Profile simplifies your operations

PROFIBUS PA Profile 3.02 In order to guarantee interoperability and to ease changeability of devices, the application of PROFIBUS PA devices has been standardized in the PROFIBUS PA Profile. This consists of several specifications for functionality of e.g. transmitters, actuators and analysis devices.

By using the PA Profile 3.02 the operation of PROFIBUS devices is drastically simplified:

- Easy device exchange
 - Each device recognizes its own identification (software version, device revision) and supported ident numbers.
 - Devices can automatically overtake roles from former device versions (automatic ident number adaptation).
- Diagnostics according to NAMUR NE 107
 - Device diagnostics are directly sent according to NE 107.
 -  Functional Check
 -  Failure
 -  Diagnostics Active
 -  Maintenance Required
 -  Out of Specification
 - This condensed status provides a valuable overview for operators and maintenance staff.
 - The detailed diagnostic events are still available and can be used for further maintenance actions.

- Fast up- and download of parameters
 - During the life cycle of a plant, the parameters of a device may have to be up or downloaded several times, e.g. during commissioning, maintenance or device exchange.
 - PA Profile 3.02 devices are able to transfer the parameters up to 10 times faster. On a plant with a large number of devices, this saves a lot of time.
- Firmware version
 - Additionally, to aid recognition when switched off, the firmware version is to be found on the nameplate of every PA Profile 3.02 device.

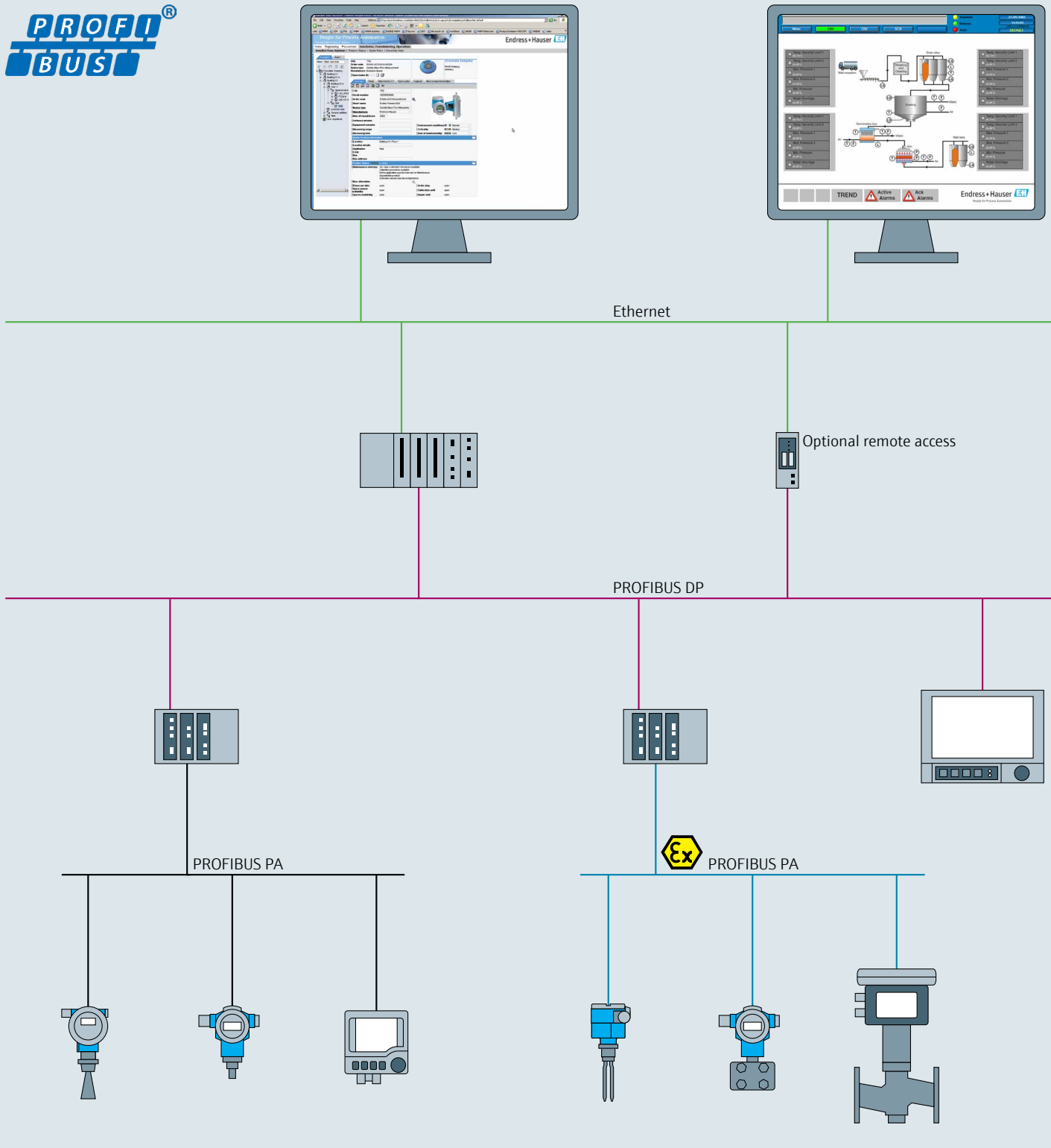


PROFIBUS PA Profile 3.02:

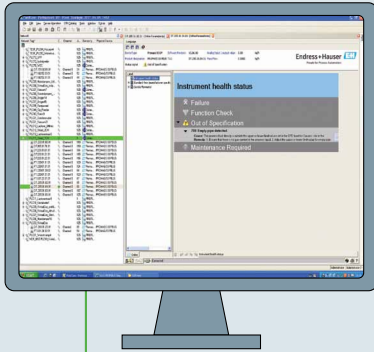
Endress+Hauser has started to integrate the PROFIBUS PA Profile 3.02 in 2011. We offer meanwhile the largest portfolio of PA Profile 3.02 compatible devices in the market, available for every important measurement principle in process automation.

PROFIBUS – transforms your data into information

Typical PROFIBUS network



PROFIBUS DP & PA installation architecture



PROFIBUS®

PROFIBUS for 100% Automation ... is proven as THE fieldbus in practical applications. Nearly every facility involving process engineering covers continuous (analog process values, closed loop control) as well as discrete automation tasks (e.g. drives, limit switch, hard real-time requirements). PROFIBUS offers consistent fieldbus communication for nearly all automation requirements in a plant. This has been the case for more than 20 years with over 50 million nodes proven in use.

PROFIBUS DP is designed for fast processes and also serves as a bus for the control level in process automation.

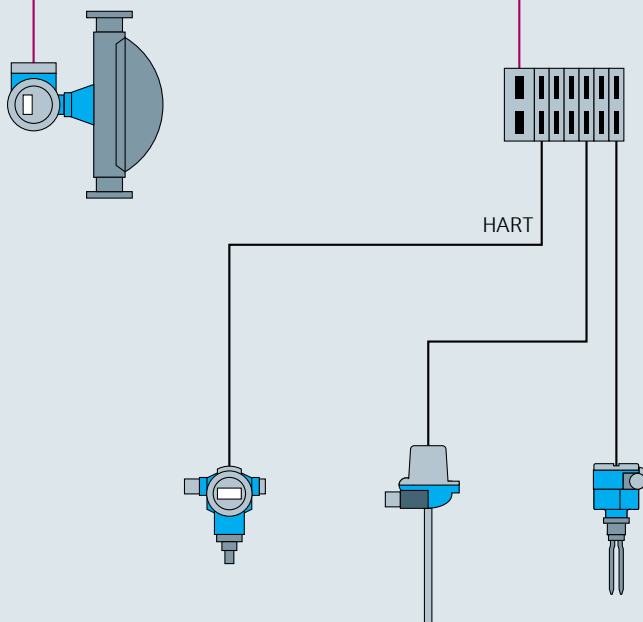
- Maximum length
 - 1200 m (copper, RS 485)
 - several kilometers (fibre optics)
- Transmission rate variable
9.6 ... 12.000 kbit/s

PROFIBUS PA was developed from PROFIBUS DP with special features for process automation. It allows bus powering of field devices, where necessary intrinsically safe.

- Maximum length
 - 1900 m (safe area)
 - 1000 m (hazardous area, Ex ia)
- Transmission rate fixed
31.25 kbit/s
- Manchester coded bus powered (MBP/MBP-IS)

PROFIBUS offers matching solutions, especially for the hybrid industries – such as food & beverages – where discrete as well as continuous automation tasks are crucial. PROFIBUS PA and DP use the same communication protocol and are therefore suitable for all industrial automation applications:

- Process automation
- Factory automation
- Motion control
- Safety





Products and services

Level



Detailed information can be found at: www.endress.com/en/products/level



Deltapilot
PA



Micropilot
PA



Gammapilot
PA



Liquiphant
PA



Levellflex
PA



Prosonic
DP/PA

Flow



Detailed information can be found at: www.endress.com/en/products/flow



Promag
DP/PA



Prowirl
PA



Promass
DP/PA



t-mass
DP/PA



Prosonic Flow
PA

Pressure



Detailed information can be found at: www.endress.com/en/products/pressure



Cerabar
PA



Deltabar
PA

Temperature



Detailed information can be found at: www.endress.com/en/products/temperature



iTEMP TMT84
PA



iTEMP TMT162
PA





Analysis

Detailed information can be found at:
www.endress.com/en/solutions/analytical-solutions



Liquiline
DP/PA



Mycom
PA



Liquistation
DP



Smartec
DP/PA



Liquisys
DP/PA

System components

Detailed information can be found at:
www.endress.com/en/products/system-components-and-recorders



Fieldgate
DP



Display
(RID14, RID16)
PA



Memograph
DP



Energymanager
(RMC621, RMS621)
DP

Software

Detailed information can be found at:
www.endress.com/en/solutions/plant-asset-management



FieldCare



W@M Portal
W@M Enterprise

i Field Network Engineering services:

Endress+Hauser offers a multitude of supporting services for Field Network Engineering:

- Network planning and analysis
- Consultation and training for network planning
- Project management
- Technology and component selection
- Commissioning
- Maintenance over the entire life cycle

More information on Field Network Engineering:
www.endress.com/en/solutions/field-network-engineering

PROFIBUS technology training:

A comprehensive range of technology training courses is available:

- Based on hands-on experience, recognized in all industries
- Application specific and practically orientated
- Manufacturer independent

Details on the current training program:
www.endress.com/en/events/training



Supplementary documentation

- Field Network Engineering
Competence Brochure – CP01088S/04/EN
- FieldCare
Competence Brochure – CP00001S/04/EN
- Plant Asset Management
Field of Activities – FA00024S/04/EN

Additional information

Web:

www.endress.com/en/solutions/field-network-engineering/profibus-technology

www.endress.com/en/events/training

www.addresses.endress.com
