optimize!
softing

Products and solutions for digital communication in process automation

Industrial
softing

PROCESS DIGITIZATION

The increasing global scarcity of raw materials, the demands of higher energy efficiency, and the increasing demand for customer-specific products, increasingly require higher efficiency and more flexibility of production.

The related optimization of plants and production processes is based on information about processes and equipment conditions. Essential prerequisite for obtaining this information is a system-wide exchange of production and plant data.

In order to set up such a data exchange for distributed control systems, plant asset management as well as analysis applications for production and business management – the sensors, devices, control systems and production facilities must be seamlessly networked horizontally and vertically.

The transfer of data beyond the pure process value and their integration into superordinate systems, also at the IT level, require digital communication based on interoperable standards.

SOFTING EXPERTISE
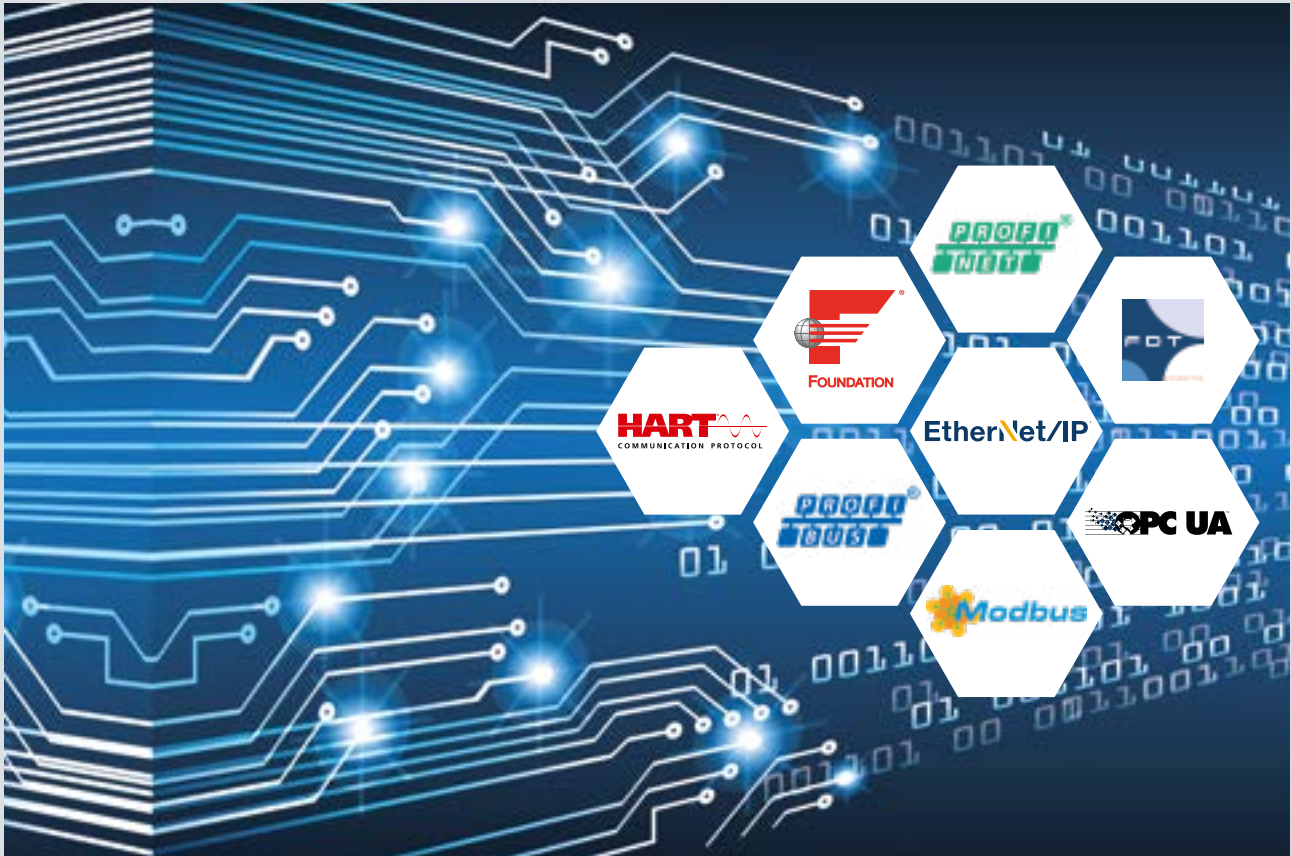
The digital data exchange on the basis of industrial communication standards is a core competence of Softing. From an early stage, the focus was on technologies with particular relevance for process automation. Softing's experts contributed substantially to the specification of e.g. PROFIBUS and FOUNDATION Fieldbus.
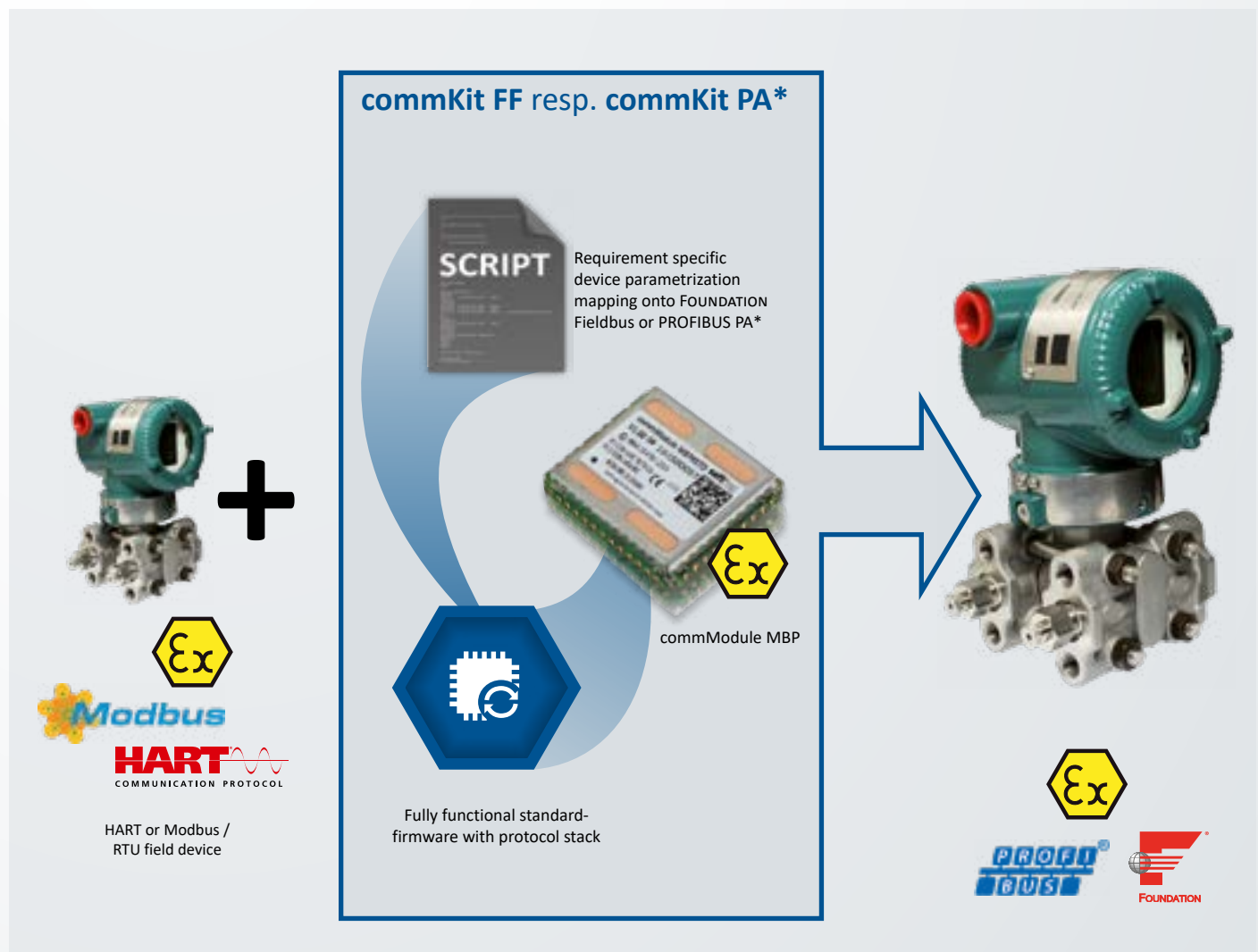
Even today, Softing is actively involved in the technical workgroups of the Fieldcomm Group, the PROFIBUS & PROFINET International and the OPC Foundation in order to be close to technological developments and to help shape them.

On the basis of this technological know-how and the competence for Ex-capable hardware Softing offers solutions for embedding digital communications technologies. In this area Softing is a strategic partner to international equipment and system manufacturers. To system integrators and plant operators Softing offers products for the integration and configuration of devices and networks.

Integration of fieldbus and Industrial Ethernet technologies for field devices

Scalable module-based solution or portable protocol software

For field device manufacturers, Softing offers various options for integrating FOUNDATION Fieldbus H1, PROFIBUS PA, PROFIBUS DP, Ethernet / IP, PROFINET and OPC UA. The most efficient way to integrate FOUNDATION Fieldbus H1 and PROFIBUS PA* is based on a universal hardware module with Ex certification. A configuration script for the module firmware is used to define the specific scope of the communication interface. The script can be created by the customer himself or as part of a joint project with Softing. A new script allows you to change the amount of data and device information available via the fieldbus at any time, without modifying the hardware. If the module cannot be used due to a special device architecture and also for Industrial Ethernet technologies, Softing offers flexible, integrable communication solutions (commStack).

commKit FF resp. **commKit PA***

Requirement specific device parametrization mapping onto FOUNDATION Fieldbus or PROFIBUS PA*

commModule MBP

HART or Modbus / RTU field device

Fully functional standard-firmware with protocol stack

commModule MBP – Universal hardware for FOUNDATION Fieldbus and PROFIBUS PA*

- Solderable module in a compact design (40 mm x 40 mm x 10 mm)
- Pre-certified according to PROFIBUS PA and FOUNDATION Fieldbus for fast device certification
- UART, I2C, SPI data interfaces
- Ex certification (ATEX, IECEx, FM)
- „Conformal Coating"

commScript FF resp. **commScript PA*** – Demand-specific configuration of the module-firmware for PROFIBUS PA and FOUNDATION Fieldbus

- Fast integration of a communication interface according to customer requirements and without programming
- Flexible interface functionality through variable mapping of process value and selected device parameters of HART or Modbus RTU on fieldbus
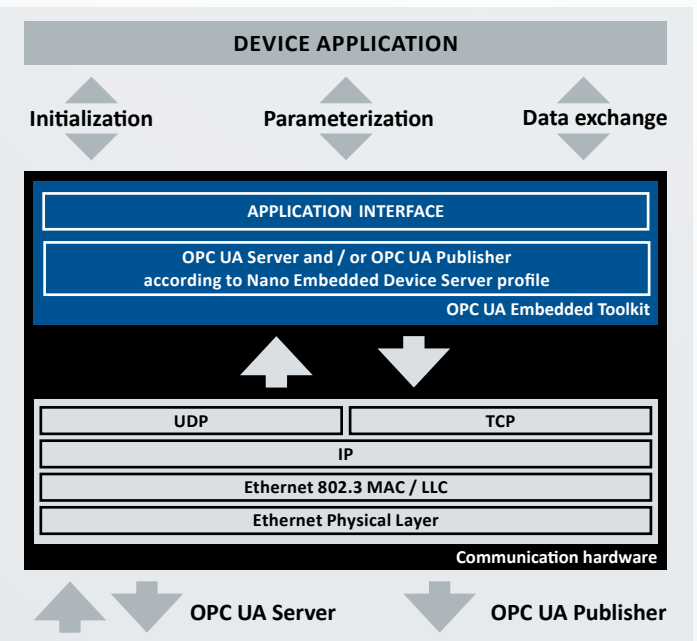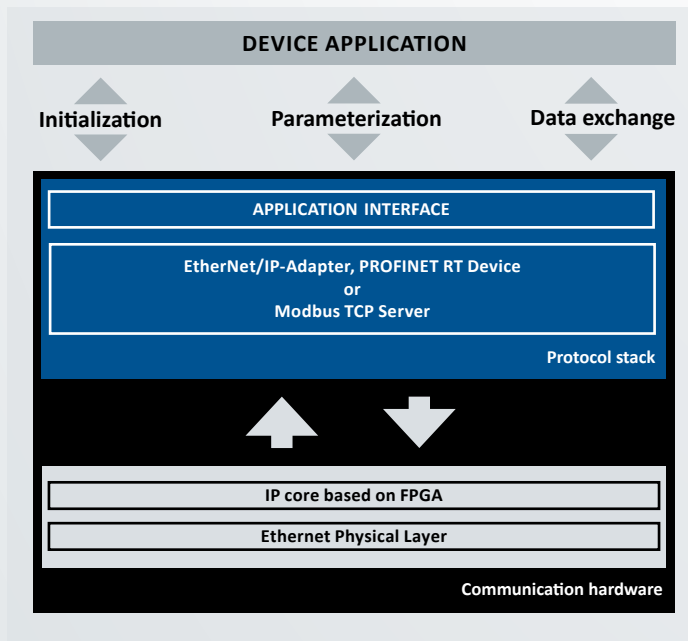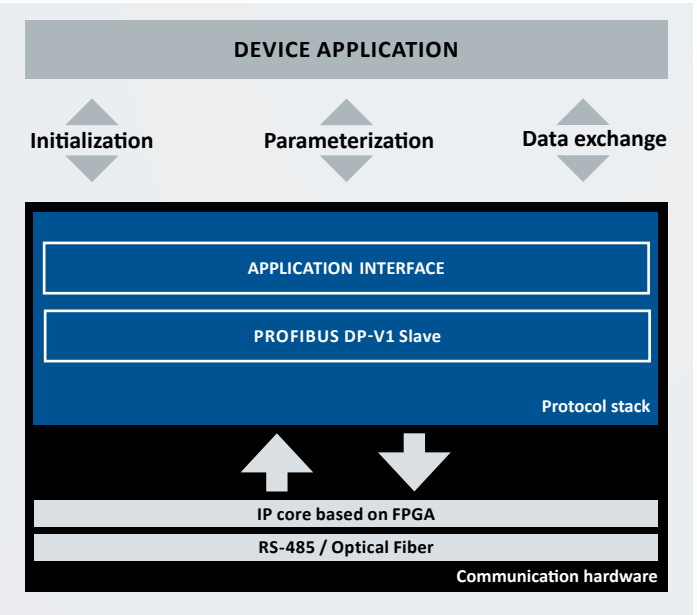- Project support by Softing developers (option)

*available from Q4 2018

commStack – Portable protocol software

- Device stacks for HART, PROFIBUS PA, Foundation Fieldbus H1, PROFIBUS DP, EtherNet/IP and PROFINET RT
- Support of all specified protocol functions
- Support for different target platforms (processors, operating systems, memory configurations)
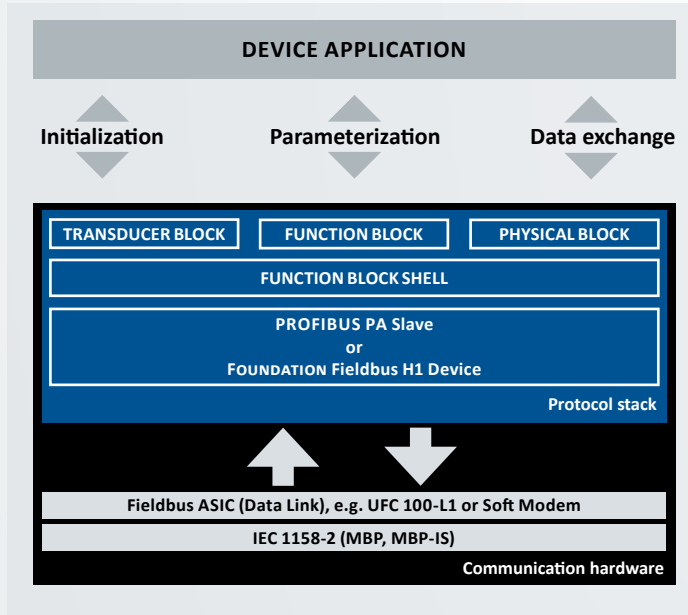
UFC100-L1 – Fieldbus ASIC for customer-specific communication hardware

- Full pin compatibility to Yamaha YTZ 420 (FIND1 +)
- Support for FF H1 and PROFIBUS PA in field devices and hosts
- Reduced communication load for device CPU
- Long-term availability

DEVICE APPLICATION

Initialization   Parameterization   Data exchange

TRANSDUCER BLOCK | FUNCTION BLOCK | PHYSICAL BLOCK
FUNCTION BLOCK SHELL
PROFIBUS PA Slave
or
Foundation Fieldbus H1 Device
Protocol stack

Fieldbus ASIC (Data Link), e.g. UFC 100-L1 or Soft Modem
IEC 1158-2 (MBP, MBP-IS)
Communication hardware

DEVICE APPLICATION

Initialization   Parameterization   Data exchange

APPLICATION INTERFACE
PROFIBUS DP-V1 Slave
Protocol stack

IP core based on FPGA
RS-485 / Optical Fiber
Communication hardware

DEVICE APPLICATION

Initialization   Parameterization   Data exchange

APPLICATION INTERFACE
EtherNet/IP-Adapter, PROFINET RT Device
or
Modbus TCP Server
Protocol stack

IP core based on FPGA
Ethernet Physical Layer
Communication hardware

DEVICE APPLICATION

Initialization   Parameterization   Data exchange

APPLICATION INTERFACE
OPC UA Server and / or OPC UA Publisher
according to Nano Embedded Device Server profile
OPC UA Embedded Toolkit

UDP | TCP
IP
Ethernet 802.3 MAC / LLC
Ethernet Physical Layer
Communication hardware

OPC UA Server   OPC UA Publisher

OPC UA embedded Toolkit – Development of in the field device embedded OPC UA servers or OPC UA publishers

- Conformance with OPC UA PubSub Specification V1.04 RC and Nano Embedded Device Server profile
- For Linux or Windows operating systems
- Source code in ANSI C
- Low memory requirements and minimized CPU load

Services

- Support for module-based integration
- Consulting and development of customer-specific, Ex-compatible communication hardware
- Stacking and firmware development
- Pre-certification (Physical layer, Conformance, Interoperability)

data ◆ FLOW®

Mobile solutions for device parameterization, network configuration and monitoring tasks

USB and Bluetooth interfaces and software for commissioning and maintenance

Modern field devices are complex systems that provide a variety of information in addition to the actual process value, e.g. trends, historical values and diagnostic data. For their intended operation, these devices require the setting of a variety of parameters. For commissioning engineers and maintenance personnel, Softing offers mobile USB interfaces for device parameterization for the three most important communication protocols in process automation: HART, FOUNDATION Fieldbus and PROFIBUS PA. By means of optionally available communication DTMs the connection to software tools according to FDT standard is guaranteed. Furthermore, mobiLink also includes software for network configuration and device parameterization of FF networks. Application software manufacturers can directly integrate the interface through the disclosed programming interface (API). The same applies to the PROFIBUS DP and the CAN-bus- interface.

Example: Connection to HART device

240 Ω

24 V

Slave
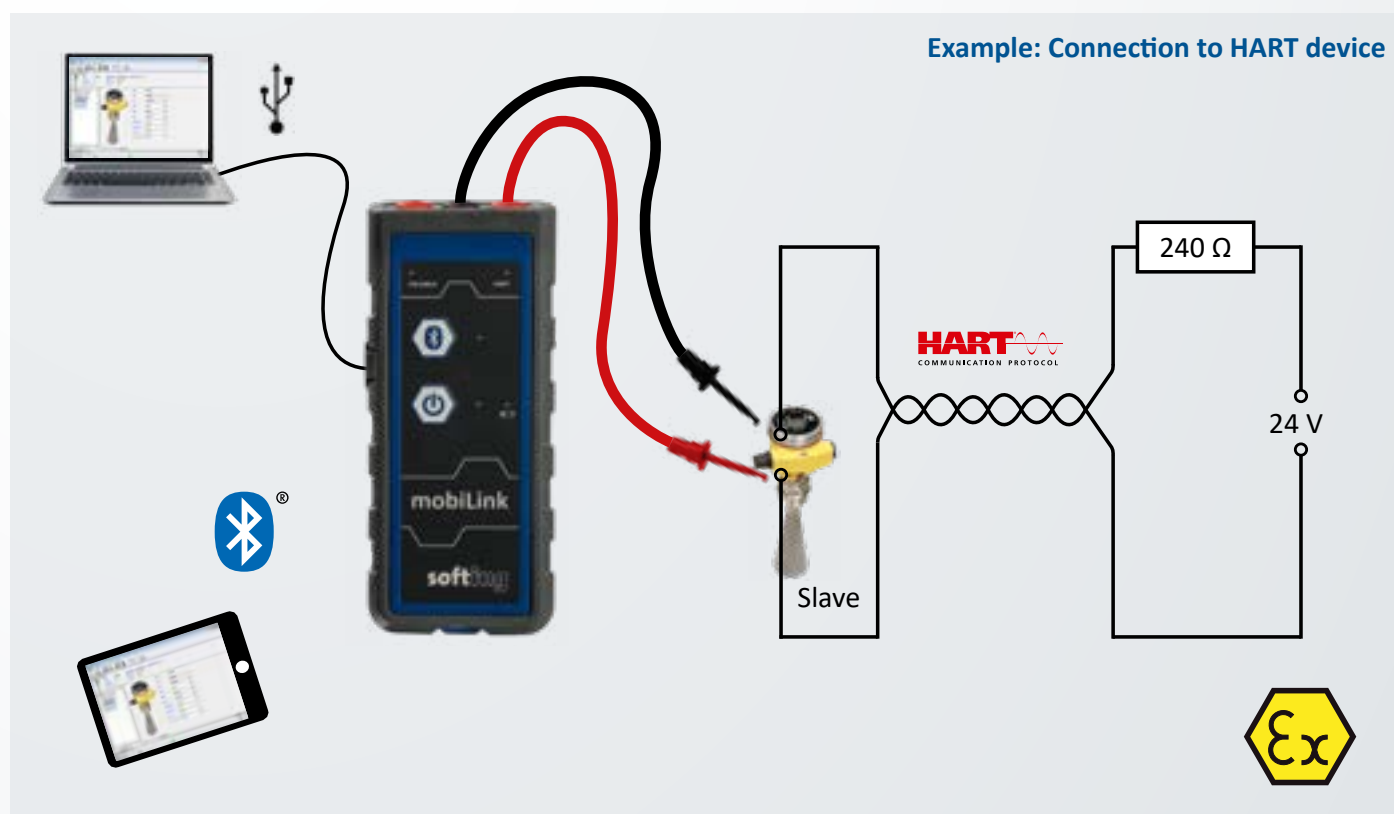
mobiLink – Mobile interface for commissioning and maintenance of fieldbus and HART field devices

- Multi-protocol capable: HART master, FOUNDATION Fieldbus host and PROFIBUS PA master (from Q3 / 2018) in one device
- For temporary connection to fieldbus segments and HART current loops for individual communication with field devices
- Ideal for mobile applications thanks to battery operation and Bluetooth interface
- USB interface for bench host operation
- Compatible with FDT frame applications and engineering tools
- Approved for use in hazardous areas

PBpro USB – USB interface for parameterization of PROFIBUS devices

- USB 2.0 high-speed interface in the housing of a PROFIBUS connector
- No reflection-induced interference
- Direct support for ToolSuite CDT (auma) and AMS Suite (Emerson)
- Integration into FDT-based software tools using communication DTM
- API for direct integration into customer-applications

CANpro USB – CAN high-speed USB interface for direct integration into customer-specific software via API

- USB 2.0 high speed interface
- Heavy Duty version with:
  - Snap-in USB cable connector
 - Operating temperature -20 °C … +70 °C

Ethernet gateways for process control and plant asset management

Integration of FOUNDATION Fieldbus and PROFIBUS devices

The control, monitoring and optimization of continuous production processes and facilities require an integrated automation technology. In particular FOUNDATION Fieldbus and PROFIBUS offer at present the possibility for comprehensive monitoring and Plant Asset Management. This is due to the pure digital communication at a comparably high baud rate all the way down to field level inclusive hazardous areas and due to the comprehensive availability of suitable automation components. To connect FOUNDATION Fieldbus H1 devices via Modbus TCP or FOUNDATION Fieldbus HSE to control and Plant Asset Management systems the FG-200 is a proven solution.
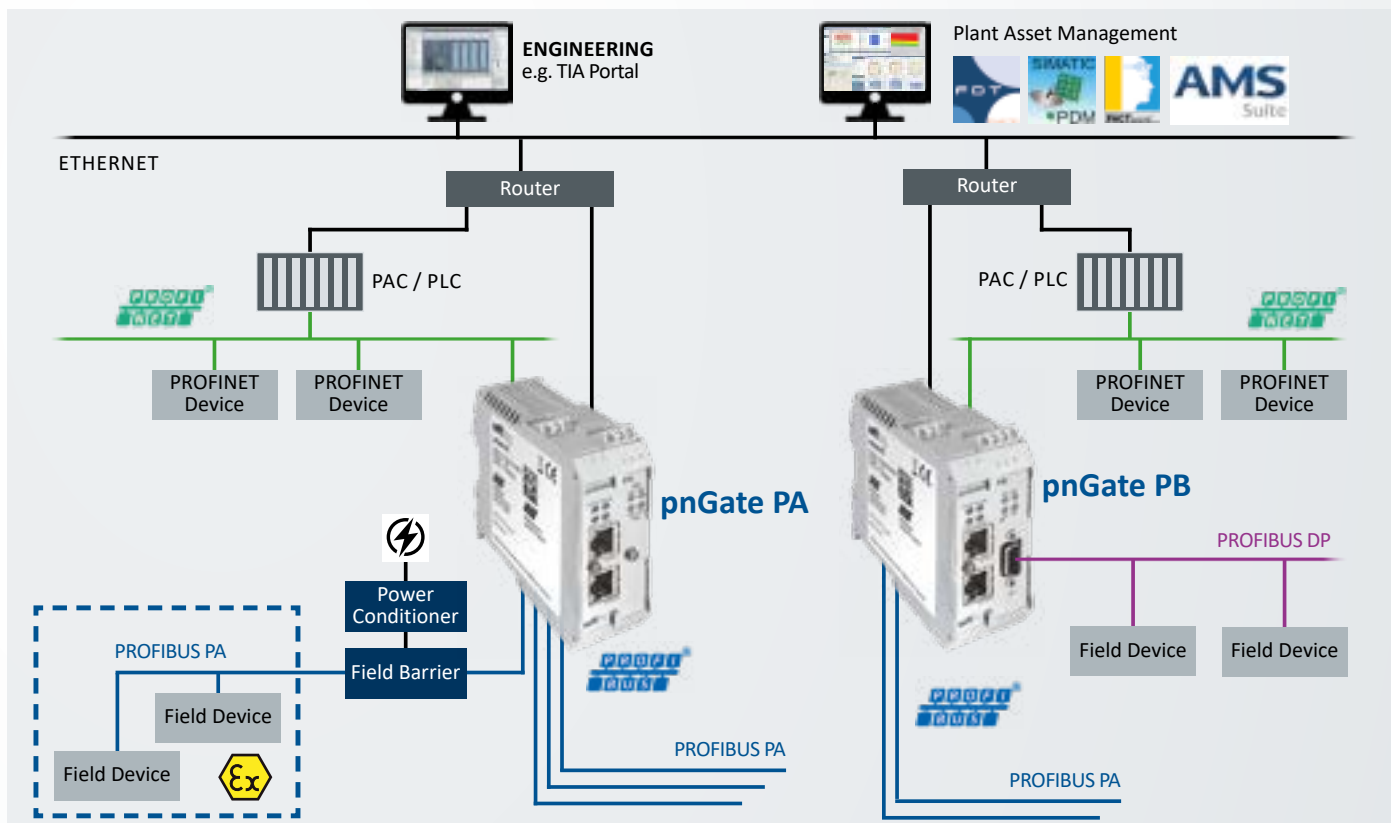
The direct integration of PROFIBUS PA segments in control architectures leveraging PROFINET or Modbus TCP is enabled through pnGate PA and pnGate PB respectively mbGate PA. TH LINK PROFIBUS provides access to PROFIBUS DP and HART devices for Plant Asset Management tasks and remote device-parameterization. In combination with the SCOPE diagnostic software, it additionally enables the monitoring of PROFIBUS communication.
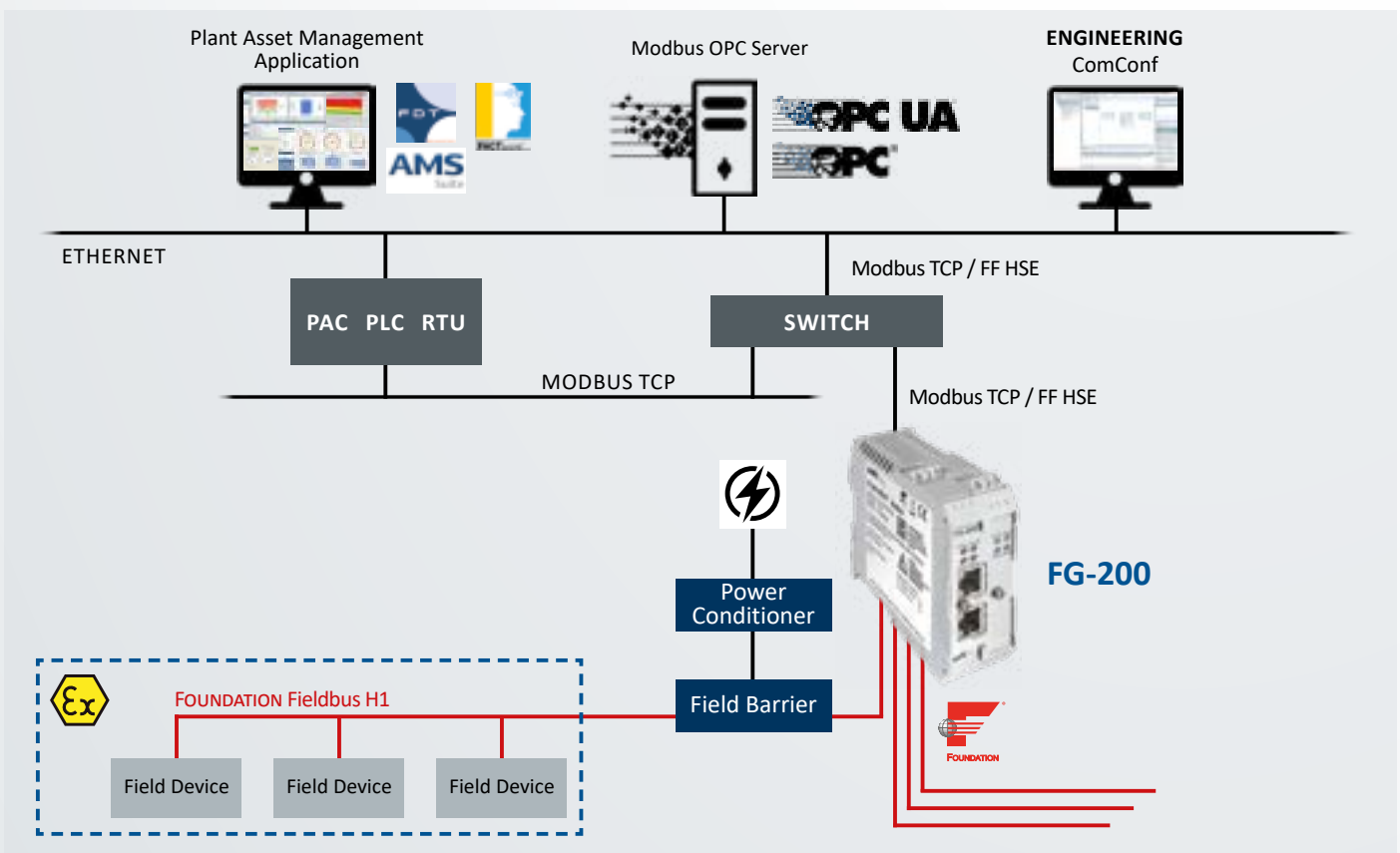
FG-200 – Integration of FOUNDATION Fieldbus H1 Devices in Modbus architectures

- Ethernet integration using Modbus TCP and Foundation Fieldbus HSE
- Integration of FOUNDATION Fieldbus field devices in Modbus RTU systems
- Connection of up to 4 FF segments
- Support of Ethernet redundancy
- Support of device redundancy (Type D-3 according to specification FF-593)
- Plant Asset Management access via FDT / DTM or direct connection to the Emerson AMS Suite
- FF configuration software for cyclic communication and device parameterization

- Partially automated Modbus register mapping in provided configuration software
- Suitable for use in Zone 2
- Modbus OPC server with preconfigured value mapping for plug and play connection using dataFEED OPC Suite (Option)

pnGate PB – Integration of PROFIBUS networks in PROFINET systems

- Separate connection to a PROFIBUS DP segment and up to two PROFIBUS PA segments
- Configuration and parameterization based on GSDML, e.g. through the Siemens TIA portal
- Support for FDT / DTM
- PROFINET system redundancy S2 in preparation
- Further use of existing power conditioners

## pnGate PA – Direct integration of PROFIBUS PA segments into PROFINET systems

- Connection of up to four PROFIBUS PA segments without DP intermediate segment
- Configuration and parameterization based on GSDML, e.g. through the Siemens TIA Portal
- Support for FDT / DTM
- PROFINET system redundancy S2 in preparation
- Further use of existing power conditioners
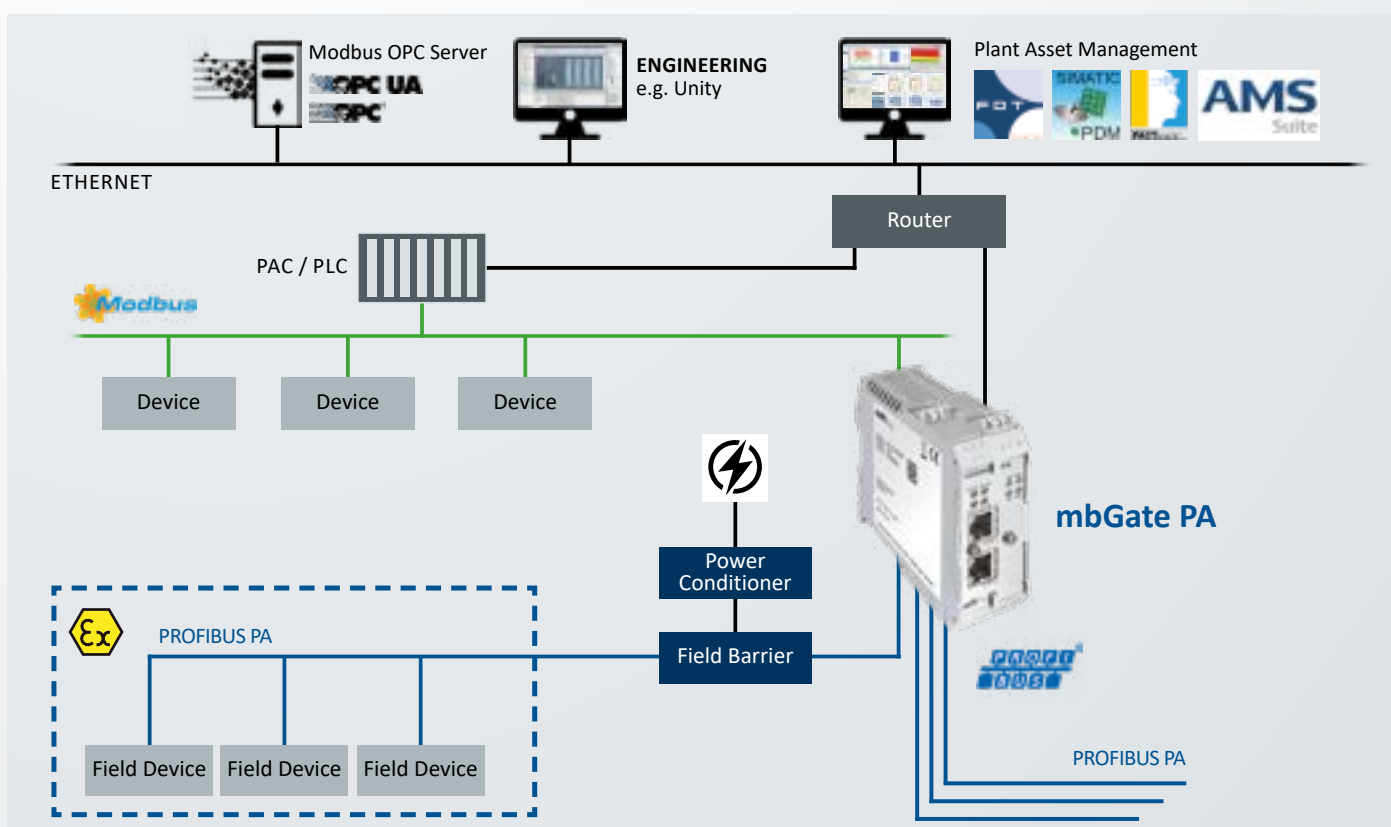
mbGate PA – Direct integration of PROFIBUS PA segments into Modbus TCP systems

- Connection of up to 64 PROFIBUS PA devices on max. 4 segments
- PROFIBUS configuration via webserver and "drag and drop" based on GSD file import
- Saving of PROFIBUS configuration as HTML file
- Reuse of existing power conditioners

- Modbus configuration through Unity PRO of Schneider Electric or Siemens TIA portal by leveraging a HTML report with PROFIBUS configuration
- Support of FDT / DTM for device parameterization and Plant Asset Management
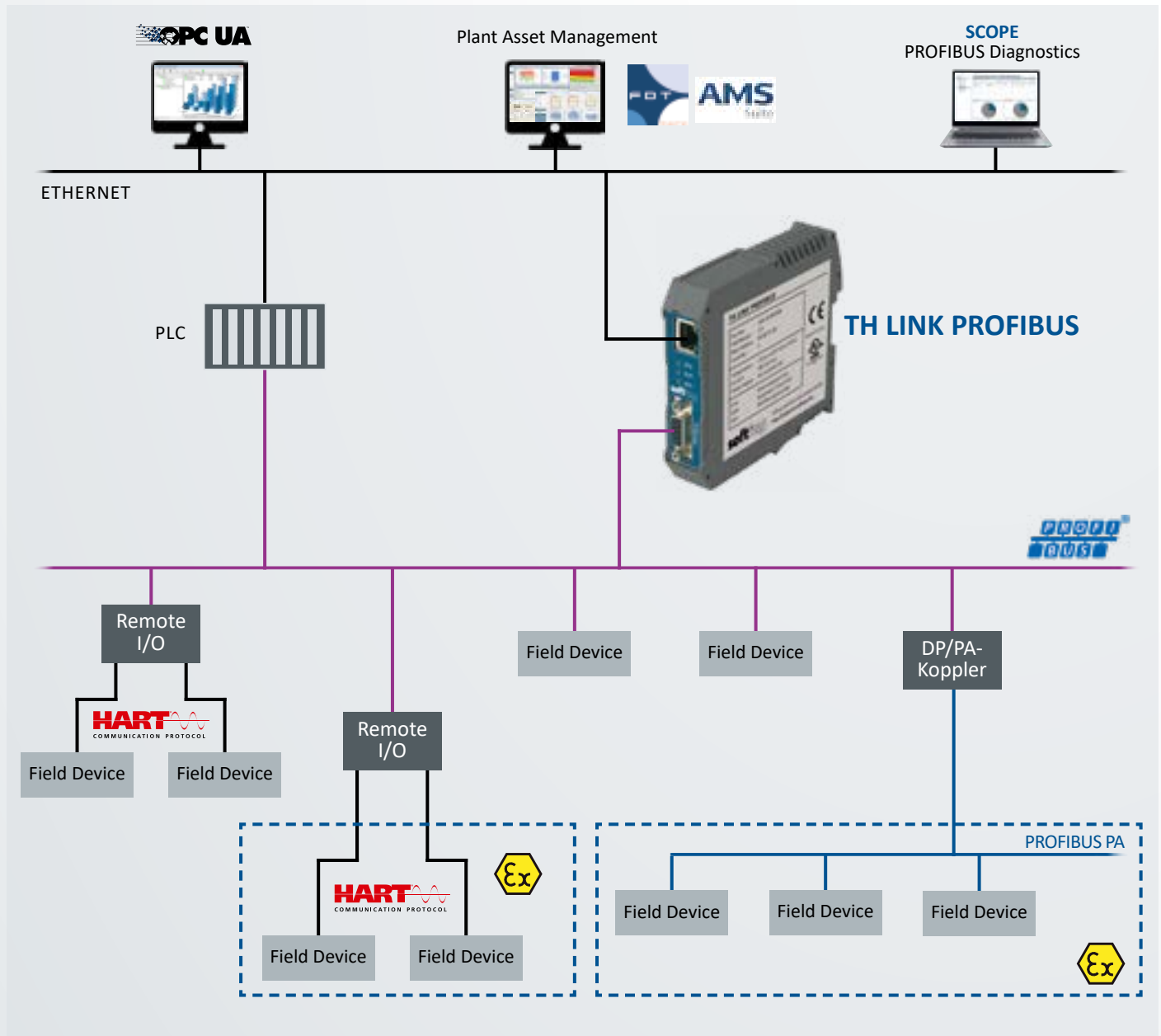
TH LINK PROFIBUS – PROFIBUS DP network access for Plant Asset Management and Network Monitoring

- Support of connected HART segments
- Comprehensive monitoring of process-critical devices
- Central administration of all device parameters and simple device replacement
- Device parameterization directly from the control room
- Support for FDT / DTM and EDDL
- Integration into the Emerson AMS Suite via TACC software
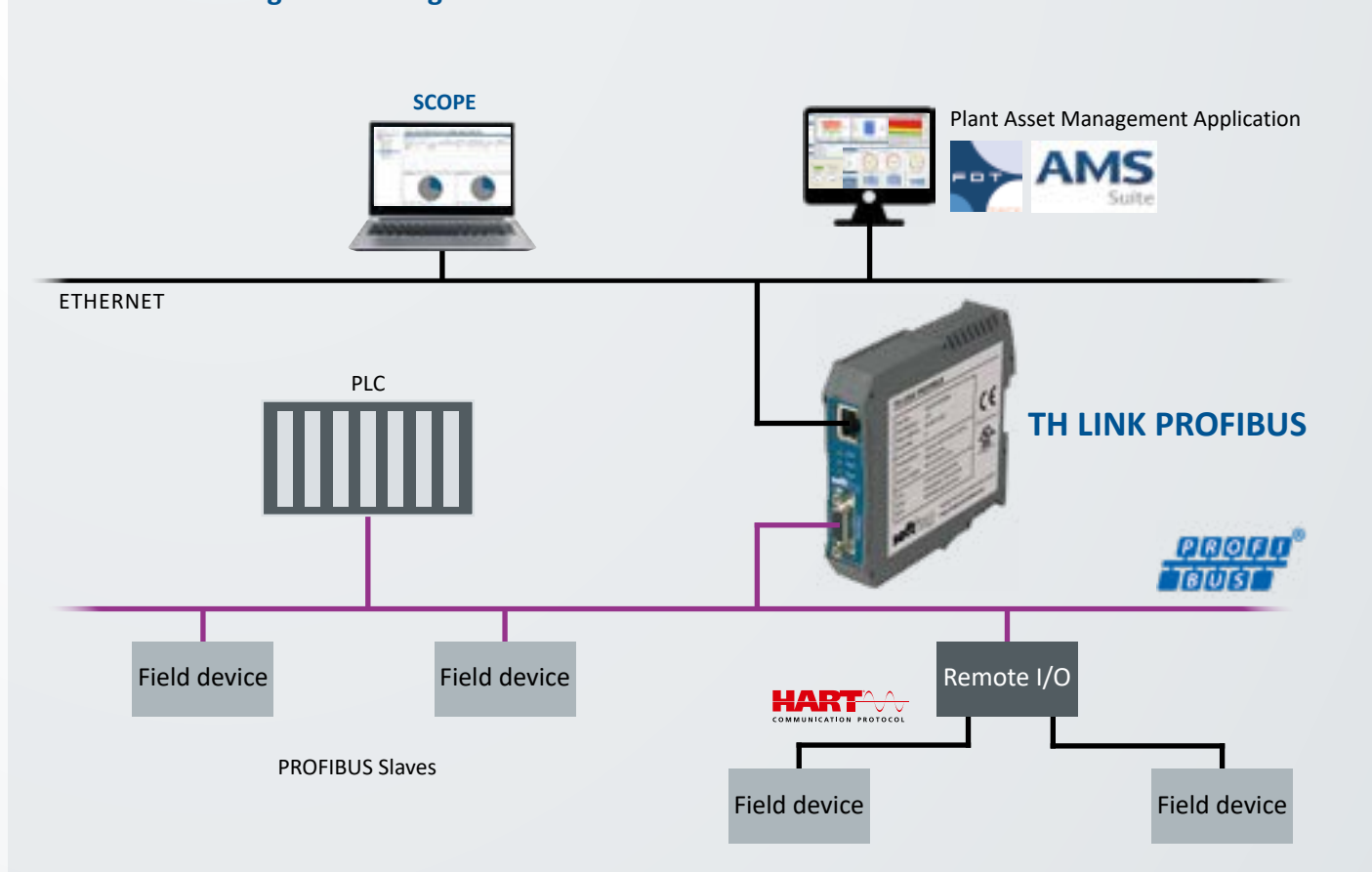- PROFIBUS monitoring with diagnostic software SCOPE (option)

Solutions for monitoring, commissioning and troubleshooting of PROFIBUS networks

Mobile and stationary tools for installation, commissioning and maintenance

Ensuring reliable data exchange and the avoidance of unscheduled plant standstills are essential requirements for the communication networks in process industry plants. In order to fulfill these tasks, suitable solutions for quality assurance during installation and commissioning and for maximum plant availability are required. The PROFIBUS Tester 5 is a battery-powered, mobile tool for comprehensive diagnostics and troubleshooting in PROFIBUS installations. The bus-powered BC-230-PB is the right solution for the simple verification of a stable PROFIBUS PA communication in hazardous areas.

The network interface TH LINK PROFIBUS in combination with the monitoring software SCOPE provides predictive maintenance through the communication monitoring of PROFIBUS DP and PROFIBUS PA networks during operation.
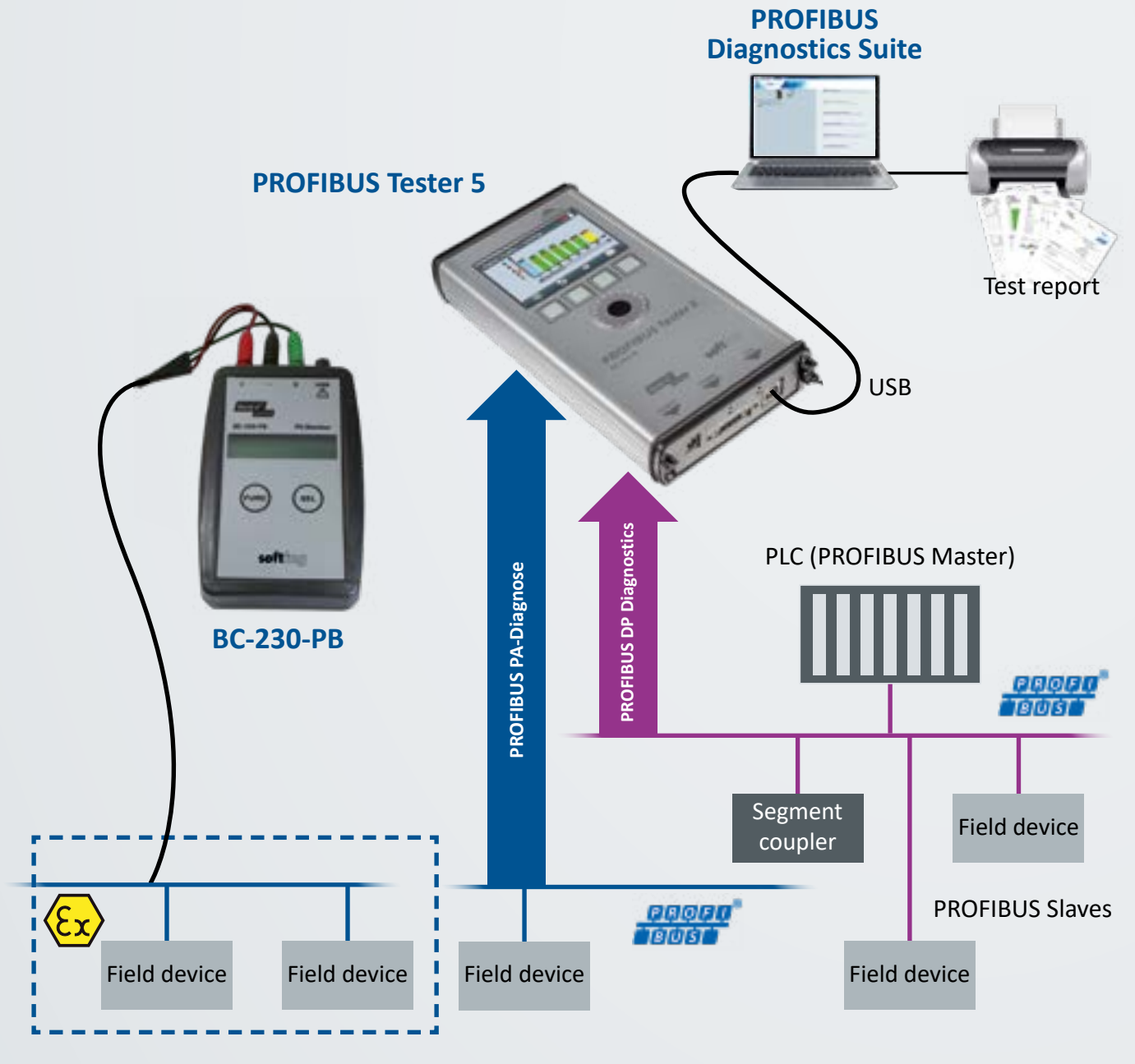
Network monitoring and -management

SCOPE

Plant Asset Management Application

ETHERNET

PLC

TH LINK PROFIBUS

Field device

Field device

Remote I/O

PROFIBUS Slaves

HART
COMMUNICATION PROTOCOL

Field device

Field device

TH LINK PROFIBUS with SCOPE –
Stationary monitoring of PROFIBUS networks

- Impact-free installation in plants, also during operation
- Passive monitoring of the PROFIBUS protocol
- Threshold monitoring for telegram repetitions
- Extensive presentation and evaluation of diagnostic data

- Monitoring for PROFIBUS DP and PA networks
- Error detection with intelligent help
- Statistics to optimize network configuration
- OPC UA interface

Commissioning, acceptance and troubleshooting

PROFIBUS Diagnostics Suite

Test report

PROFIBUS Tester 5

USB

BC-230-PB

PROFIBUS PA-Diagnose

PROFIBUS DP Diagnostics

PLC (PROFIBUS Master)

Segment coupler

Field device

PROFIBUS Slaves

Field device   Field device   Field device   Field device

PROFIBUS Tester 5 – Comprehensive mobile diagnostics and troubleshooting of PROFIBUS-networks

- Support for PROFIBUS DP and PROFIBUS PA (option)
  - Complete protocol analysis directly on the PROFIBUS PA segment
  - Specific signal analysis for MBP physics
- Complete device for cable testing, physical signal test and protocol analysis
- Master simulation and integrated storage oscilloscope
- Autonomic operation and extended diagnostics with PC-based software
- Automated creation of test reports

BC-230-PB – Easy mobile check of PROFIBUS PA in hazardous areas

- Measurements during ongoing operation
- Power supply via the fieldbus, no battery or external power supply
- Test of bus physics
- Checking the stable communication of all connected PA devices
- Easy operation with two function buttons

dataCHECK®