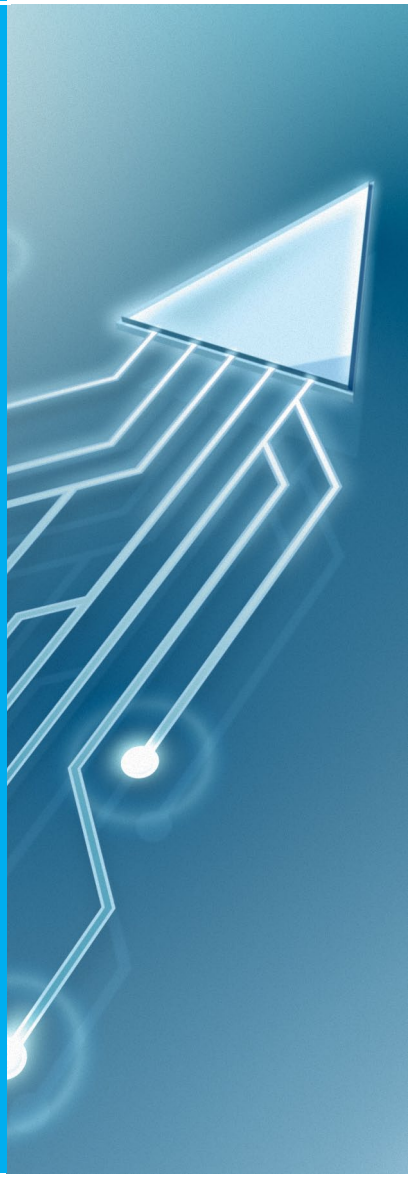
Technology Training

Your expert for industrial communication



Endress+Hauser

People for Process Automation

Content

System World in Reinach, Switzerland

Proper knowledge transfer

We offer standardized and customer-specific technology training courses conducted by experienced and certified engineers, always striving for the right balance of practice and theory. Our teaching methods are flexible: we provide classroom trainings, customized online sessions as well as “Process Automation Webinars” via web application. In an online session, trainees can participate from anywhere in the world with their own computer, headset and webcam. Screen sharing and mobile cameras balance the course content between a theoretical and practical approach. Depending on the type of training, hands-on material will be delivered to trainees for the execution of practical tasks.

Let’s share our experience and improve your knowledge

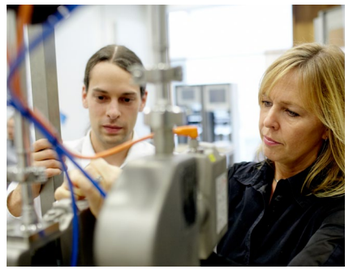
Training is a definite plus in every aspect that brings a benefit for you and your company, no matter which level of knowledge you already have.

Benefits:

- Be prepared for your tasks
- Gain practical experience and participate in experience exchange
- Be up to date with the latest developments
- Enhance your career with the step-by-step training schedule

Certified Training for PROFIBUS DP Engineer

Recognized and certified by the PROFIBUS organization



Number of participants
Max. 8

Duration
3 days
Also combinable with "Certified Training for PROFIBUS PA Engineer" to a 5 days training program

Course dates
For details:
www.endress.com/technology-training

Location
- Training Center in Reinach
- On-site

Registration and costs
Phone +41 61 715 73 78
E-mail training@solutions.endress.com

Target group
- System Programmers
- Control and Instrumentation Engineers
- Design and Planning Engineers
- Service and Maintenance Engineers, Installers

Prerequisites Basic knowledge of computers, electrical engineering and mathematics.

Goal At the end of the course you will be able to design and commission a PROFIBUS fieldbus network. You will understand the benefits of the technology and know the procedure for troubleshooting. The emphasis is placed on PROFIBUS DP.

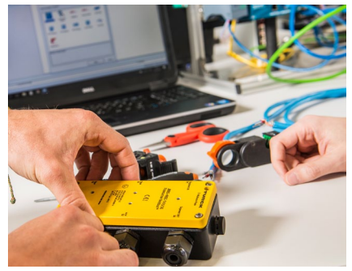
The training is internationally recognized and certified by the PI Organization.

Theory
- PROFIBUS organization and structure
- From analog to digital communication
- Physical layer of PROFIBUS DP
- PROFIBUS components
- Installation and commissioning
- Grounding and shielding concepts
- Device integration
- Parameters and configuration
- Decoding of telegrams
- Decoding and understanding of diagnosis telegrams
- Function codes and service access points used in PROFIBUS DP
- Cyclic and acyclic communication
- Cycle time calculation and bus parameters

Practice
- Wiring of a DP bus segment
- Commissioning with acyclic tools
- Cyclic communication and data handling
- Device Integration (ABB, Siemens, Rockwell, ...)
- Signal measurement and evaluation with oscilloscope
- Handling of up-to-date bus analyzers
- Decoding diagnostic information
- Errors and troubleshooting

Certified Training for PROFIBUS PA Engineer

Recognized and certified by the PROFIBUS organization



Number of participants
Max. 8

Duration
4 days
Also combinable with "Certified Training for PROFIBUS DP Engineer" to a 5 days training program

Course dates
For details:
www.endress.com/technology-training

Location
- Training Center in Reinach
- On-site

Registration and costs
Phone +41 61 715 73 78
E-mail training@solutions.endress.com

Target group
- System Programmers
- Control and Instrumentation Engineers
- Design and Planning Engineers
- Service and Maintenance Engineers, Installers

Prerequisites Basic knowledge of computers, electrical engineering and mathematics.

Goal At the end of the course you will be able to design and commission a PROFIBUS fieldbus network. You will understand the benefits of the technology and know the procedure for troubleshooting. The emphasis is placed on PROFIBUS PA and partly DP.

The training is internationally recognized and certified by the PI Organization.

Theory
- PROFIBUS organization and structure
- From analog to digital communication
- Physical layer of PROFIBUS PA
- PROFIBUS components
- Installation and commissioning
- Grounding and shielding concepts
- Device integration
- Diagnosis and status
- PA profiles
- Parameters and configuration
- Token handling
- Cyclic and acyclic communication
- FISCO and Ex concepts
- Cycle time calculation and bus parameters
- Troubleshooting on physical layer
- Identification and solving of communication problems

Practice
- Wiring of a DP/PA bus segment
- Commissioning with acyclic tools
- Cyclic communication and data handling
- Device Integration (ABB, Siemens, Rockwell, ...)
- Signal measurement and evaluation with oscilloscope
- Current and voltage measurement
- Handling of up-to-date bus analyzers
- Commissioning of demo plant
- Device replacement / troubleshooting
- Device status and diagnostic handling
- Diagnostics according to NAMUR NE 107

Certified Training for PROFIBUS Installer

Recognized and certified by the PROFIBUS organization

Number of participants
Max. 8

Duration
2 days

Course dates
For details:
www.endress.com/technology-training

Location
- Training Center in Reinach
- On-site

Registration and costs
Phone +41 61 715 73 78
E-mail training@solutions.endress.com

Target group
- Installers
- Technicians
- Maintenance Technicians
- Service/Support Specialists

Prerequisites Basic knowledge of electrical engineering and ability to use a computer.

Theory
- PROFIBUS organization
- Overview PROFIBUS DP/PA
- Installation guidelines
- Fieldbus cable
- DP and PA components
- Cable routing
- Grounding and shielding
- Termination
- Device addressing
- Assembly acceptance
- PROFIBUS tools
- Measurements on the physical layer of PROFIBUS DP/PA

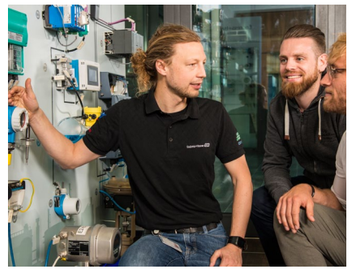
Goal At the end of the course you will be able to install new PROFIBUS networks and avoid typical installation mistakes on the physical layer of PROFIBUS DP and PROFIBUS PA segments. You will understand the benefits of the technology and know how to use the installation tools available on the market today.

The training is internationally recognized and certified by the PI Organization.

Practice
- Wiring of a DP/PA bus segment
- Device address setting
- How to measure a signal
- What is a good or bad signal
- External influences on the bus cable
- Good cabling practices
- Simulation of electromagnetic interference
- Creating a live list (scan for participants)
- Use of diverse tools on the market
- Steps to a well-functioning PROFIBUS network

Technology Training PROFIBUS DP/PA

A hands-on based course, recognized in all industries



Number of participants
Max. 8

Duration
3 days

Course dates
For details:
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E-mail training@solutions.endress.com

Target group
- System Programmers
- Control and Instrumentation Engineers
- Design and Planning Engineers
- Service and Maintenance Engineers, Installers

Prerequisites Basic knowledge of computers, electrical engineering and mathematics.

Theory
- PROFIBUS organization and structure
- From analog to digital communication
- Physical layer of PROFIBUS DP and PA
- PROFIBUS DP/PA components
- Type of device driver
- Installation and commissioning
- Device integration procedure
- Parameters and configuration
- Cyclic and acyclic communication
- Introduction PROFIBUS telegram
- Physical signal evaluation

Goal At the end of the course you will understand the benefits of the technology and know the procedure for installation, device integration and troubleshooting. The emphasis is placed on PROFIBUS DP and PA.

The training is Endress+Hauser certified.

Practice
- Wiring of a DP and PA bus segment
- Commissioning with acyclic tools
- Cyclic communication and data handling
- Device Integration (ABB, Siemens, Rockwell, ...)
- Signal measurement and evaluation with oscilloscope
- Current and voltage measurement
- Handling of up-to-date bus analyzers
- Device replacement / troubleshooting

Technology Training FOUNDATION Fieldbus

A hands-on based course, recognized in all industries

FOUNDATION

Number of participants
Max. 8

Duration
3 days

Course dates
For details:
www.endress.com/technology-training

Location
- Training Center in Reinach
- On-site

Registration and costs
Phone +41 61 715 73 78
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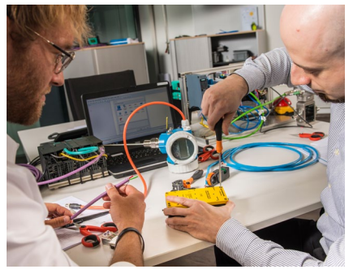

Target group
- Technicians
- Maintenance Technicians
- Service/Support Specialists
- Supervisors
- Programmers, Device Configurers
- Engineers

Prerequisites Basic knowledge of electrical engineering and ability to use a computer.

Goal At the end of the course you will understand the benefits of the technology and know the state-of-the-art workflows for design, device integration as well as maintenance/troubleshooting procedures with current tools (host systems). Practical hands-on tasks will deepen the parts learned in theory.

The training is Endress+Hauser certified.

Theory
- Organization of the Fieldbus Foundation
- From analog to digital communication
- FOUNDATION Fieldbus physical layer (H1, HSE)
- Types of wires and components
- Grounding and shielding concept
- FISCO, Ex-concepts
- Segment calculation (voltage, current loads, number of devices)
- FOUNDATION Fieldbus communication method
- Device identification
- Device Descriptions (DDs)
- Link Active Scheduler (LAS) capabilities
- Device integration procedure
- Resource, transducer blocks
- Function block types and parameters

Practice
- Wiring of FOUNDATION Fieldbus segments
- Device integration into different host systems
- Creating control strategies
- Device configuration via DD and DTM
- Signal measurement with oscilloscope
- Bus analysis with the latest tools
- Procedures for troubleshooting
- Device replacement

Technology Training HART

A hands-on based course, recognized in all industries

HART COMMUNICATION PROTOCOL

Number of participants
Max. 8

Duration
1 day

Course dates
For details:
www.endress.com/technology-training

Location
- Training Center in Reinach
- On-site

Registration and costs
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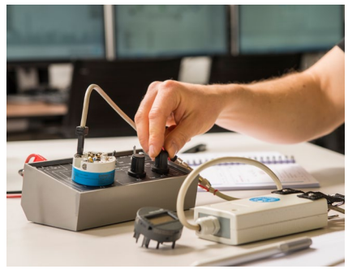
E-mail training@solutions.endress.com



Target group
- System Programmers
- Control and Instrumentation Engineers
- Design and Planning Engineers
- Service and Maintenance Engineers, Installers

Prerequisites Basic knowledge of computers, electrical engineering and mathematics.

Goal At the end of the course you understand how HART works as well as be aware of the possibilities and have the know-how to handle diagnostic information. With practical hands-on cases you will learn how to get the best out of the technology.

The training is Endress+Hauser certified.

Theory
- History and organization
- Basic technology
- HART revision and features
- Topology overview
- Introduction to HART commands
- Device Driver DD and FDT/DTM
- HART protocol
- Device diagnostic handling
- Introduction WirelessHART

Practice
- Point-to-point connection
- Multidrop connection
- Multiplexer in-line
- HART-over-PROFIBUS
- Parameterization with HART handheld
- Device integration into host systems
- Sending commands
- Data interpretation, bus analyzer
- Diagnostic data handling
- Troubleshooting

Technology Training WirelessHART

A hands-on based course, recognized in all industries

WirelessHART

Number of participants
Max. 8

Duration
2 days

Course dates
For details:
www.endress.com/technology-training

Location
- Training Center in Reinach
- On-site

Registration and costs
Phone +41 61 715 73 78
E-mail training@solutions.endress.com

Target group
- Technicians
- Maintenance Technicians
- Service/Support Specialists
- Supervisors
- Programmers, Device Configurers
- Engineers

Prerequisites Basic knowledge of electrical engineering in process automation and ability to use a computer.

Theory
- Typical applications with WirelessHART
- Radio technology basics
- WirelessHART technology
- FieldCare and FDT/DTM for WirelessHART
- Security concepts behind WirelessHART
- Basic integration of WirelessHART data into a higher application

Goal In this course you will design a basic WirelessHART network, commission it and integrate data into a higher-level application. An additional focus will be troubleshooting an existing network.

The training is Endress+Hauser certified.

Practice
- Connecting a WirelessHART Adapter
- Commissioning of a WirelessHART Adapter with DTM technology
- Commissioning of a WirelessHART network
- Integration of field devices via WirelessHART in a higher application
- Troubleshooting of a WirelessHART network

Technology Training Modbus

A hands-on based course, recognized in all industries

Modbus

Number of participants
Max. 8

Duration
1 day

Course dates
For details:
www.endress.com/technology-training

Location
- Training Center in Reinach
- On-site

Registration and costs
Phone +41 61 715 73 78
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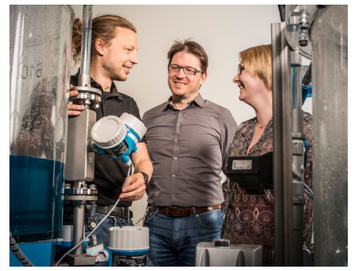


Target group
- Technicians
- Maintenance Technicians
- Service/Support Specialists
- Supervisors
- Programmers, Device Configurers
- Engineers

Prerequisites Basic knowledge of electrical engineering in process automation and ability to use a computer.

Theory
- History and typical use cases for Modbus applications
- Difference between Modbus RTU, TCP and ASCI
- Principle of data handling
- Modbus mapping
- Register and data type
- Data interpretation

Goal At the end of the course you will understand Modbus technology as used in process automation. You will learn about typical Modbus installations and how the communication works. You will wire up a Modbus segment and get it to work. An additional focus will be integrating and interpreting data in a host system and troubleshooting a Modbus system.

The training is Endress+Hauser certified.

Practice
- Wiring and commissioning of a Modbus segment
- Mapping of data
- Integrate field device data into a DCS
- Reading and writing data
- Troubleshooting

Industrial Ethernet Training Basic Industrial Ethernet

A hands-on based course, recognized in all industries

Ethernet

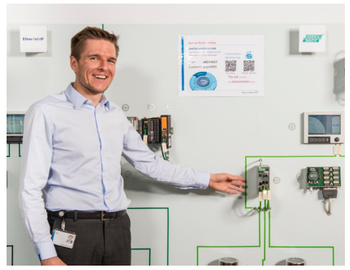
Number of participants
Max. 8

Duration
2 days

Course dates
For details:
www.endress.com/technology-training

Location
- Training Center in Reinach
- On-site

Registration and costs
Phone +41 61 715 73 78
E-mail training@solutions.endress.com



Target group
- Technicians
- Maintenance Technicians
- Service/Support Specialists
- Supervisors
- Programmers, Device Configurers
- Engineers

Prerequisites Basic knowledge of electronics and ability to use a computer.

Theory
- Development of Ethernet
- ISO/OSI model
- Types of wires and components
- Network structures and network settings
- Useful DOS commands
- Wireless networks
- Basics on antennas and frequencies
- Safety and encryption
- Tools
- Protocols used in the industry
- IT security
- VPN (Virtual Private Network)
- Remote access to industrial facilities
- Perspectives and trends

Goal At the end of the course you will understand the basics of Ethernet as used in an industrial environment. You will learn about the benefits of Ethernet technology in industrial applications, but also about possible outside influences.

The training is Endress+Hauser certified.

Practice
- Wiring of Ethernet segments
- Device setup
- Troubleshooting
- Setup of wireless networks

Industrial Ethernet Training PROFINET

A hands-on based course, recognized in all industries

Number of participants
Max. 8

Duration
3 days

Course dates
For details:
www.endress.com/technology-training

Location
- Training Center in Reinach
- On-site

Registration and costs
Phone +41 61 715 73 78
E-mail training@solutions.endress.com

Target group
- Technicians/Maintenance Technicians
- Service/Support Specialists
- Supervisors
- Programmers, Device Configurers
- Engineers

Prerequisites Basic knowledge of electronics and ability to use a computer.

Theory
- Introduction to PROFINET
- PROFINET vs. PROFIBUS DP
- PROFINET basics
  - wording in PROFINET
  - components, switches, cable and connectors
  - qualities of conformance classes
- Engineering phase
  - network design
  - grounding and shielding concept
  - naming and addresses
  - network load calculation, line depth
- Commissioning phase
  - device driver
  - addressing
  - name assignment
  - ways of setting device parameters
- Introduction to PROFINET protocol
  - application relationships
  - protocol sequence
  - introduction of latest diagnostic tools

Goal At the end of the course you will be able to plan a PROFINET system and bring it into operation. By becoming familiar with the PROFINET protocol you will learn about the advantages of PROFINET technology as well as procedures for troubleshooting. The course focuses on the link between PROFINET and PROFIBUS PA as well as HART.

Please note
The course contains parts of the Basic Industrial Ethernet Training and is Endress+Hauser certified.

Practice
- Network design and calculation
- Getting the right device driver
- Network wiring
- Commissioning via Siemens TIA Portal
- Reading and writing process values
- PROFIBUS PA and HART device integration via Proxy and Remote I/O
- Device exchange procedure
- Error simulation
- Introduction of troubleshooting tools
- Troubleshooting tasks

Industrial Ethernet Training EtherNet/IP

A hands-on based course, recognized in all industries

EtherNet/IP™

Number of participants
Max. 8

Duration
3 days

Course dates
For details:
www.endress.com/technology-training

Location
- Training Center in Reinach
- On-site

Registration and costs
Phone +41 61 715 73 78
E-mail training@solutions.endress.com

Target group
- Technicians
- Maintenance Technicians
- Service/Support Specialists
- Supervisors
- Programmers, Device Configurers
- Engineers

Prerequisites Basic knowledge of electrical engineering and ability to use a computer.

Theory
- ISO/OSI Model
- Network components
- Grounding and shielding concept
- EDS files
- Instances, classes, attributes
- Implicit and explicit messaging
- AOP, AOI, faceplate (Rockwell premium integration)
- Device integration procedure

Goal At the end of the course you will be able to design and commission an EtherNet/IP network. Actual hands-on tasks will help you to understand how the EtherNet/IP technology works in detail. You will understand the benefits of the technology and know the procedure for troubleshooting.

Please note
The course contains parts of the Basic Industrial Ethernet Training and is Endress+Hauser certified.

Practice
- Network setup
- Device integration
- Device configuration via AOP, Webbrowser and DTM
- Procedures for troubleshooting
- Device replacement

Online session

Free Process Automation Webinars

A new type of training has been launched recently. Process Automation Webinars are 45 min online sessions, in which you can comfortably and efficiently inform yourself about process automation trends and associated Endress+Hauser products. Every webinar session includes interaction through polls, chats and Questions & Answers time with the experts.

The participation is free of charge. Nothing is needed except a stable internet connection and a headset for participating in the Q & A part. All sessions will be held through a web-hosted video conferencing service (GoToWebinar).

Join our free webinars covering a range of process automation topics. Registration and further details online:
www.endress.com/ Events/ Seminars & Roadshows

Benefits
- Live and interactive – our experts are on hand to answer your questions.
- Our free webinars can be easily accessed at your convenience.
- With a wide range of topics, you are sure to find a subject to suit.

You want to learn more?

We offer customized online sessions on request. Get in contact with us: training@solutions.endress.com

Technology Training facts

Our training – your benefits

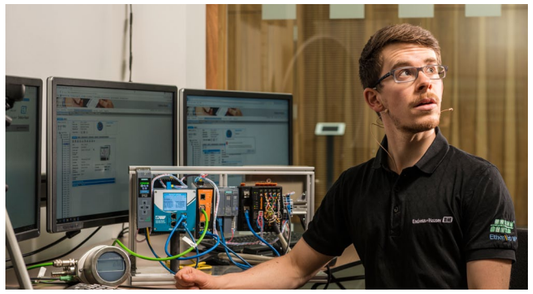
Experience
Nearly 20 years of experience in Fieldbus Training allowed us to enhance our experience in device integration with all major DCSs. Our goal from the beginning is to improve ourselves constantly. Today we use a well-established and proven teaching method.

Practical approach
All trainings are extensively based on a hands-on approach.

Vendor neutral
We offer vendor-independent training equipment (PROFIBUS, PROFINET, EtherNet/IP, HART and FOUNDATION Fieldbus). All major DCSs are combined with extensive device integration experience.

Efficient
The sessions are held in small groups for greater effectiveness.

Flexible
The training contents are adapted and customized to fit the clients' requirements. We conduct the training at Reinach, Switzerland, local Endress+Hauser Sales Centers or even at a customer's site. Furthermore, we offer remote training with web cam and remote PC control to address a larger audience.



Your Technology Training team

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References and statements

More than 600 people trained per year

EVONIK INDUSTRIES
kraft foods
Eesti Energia
PAUL SCHERRER INSTITUT PSI
STATOIL
PETRONAS
degussa. creating essentials
NOVARTIS
Reliance Industries Limited
PRONOVA BIOPHARMA
JACOBS
STAHL
WACKER
BASF The Chemical Company
DUPONT
thyssenkrupp
samson

Some of the companies trained

"I was really impressed with the quality of the training and the teaching style. Coming jetlagged into a morning meeting on a subject as potentially dry as this could have been a disaster for me, but the subject was very well organized, and the trainer did an excellent job of keeping the pace of the training appropriate to the audience and in pulling us in to participate. We also appreciate the time he spent outside of work to help us feel welcome. It was probably the best technical training session that I've attended. ..."

Chris Cueman – Core Tech Industrial Corp.

"The training was very informative and, as expected, well-prepared. During the training there was always a pleasant learning environment. This was favored by the size of the group of five people. The knowledge was best conveyed by the speakers. Questions were answered promptly. The course was realistically designed and contributed to the understanding of various processes in the bus system, which allowed better debugging in everyday operations."

Helmut Schuck – Process Automation Solutions GmbH

System World is located within the Sternenhof building in Reinach, Switzerland

Additional information

Web-based trainings, “Virtual Tour in System World” and details:
www.endress.com/technology-training

Registration and costs:
Phone +41 61 715 73 78
E-mail training@solutions.endress.com

www.addresses.endress.com

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