

# Course Prospectus

## Train with Endress+Hauser



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Our standard courses cover all levels of expertise - from those starting out in the industry through to fully qualified engineers wishing to enhance their knowledge.

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## Introduction to Process Measurement and Control

Aimed at apprentices and new starters, this four-day course is designed to provide new engineers with a basic knowledge of process measurement and control. The course has a high degree of practical content and includes assessment at key points. The course content includes:

- Basics of metrology, including terminology, reasons to measure, basic types of measurement. Understand the principles of turndown, accuracy, repeatability and linearity
- Basic electronics, including 2-wire, 4-wire, analogue and digital, Ohms law and typical loop diagrams and connections. Basic signal transmission via 4-20mA and active/passive loops
- Using a multimeter and test equipment
- Basic digital communication from HART as a hybrid signal to PROFIBUS, FOUNDATION Fieldbus, WirelessHART and Ethernet. Build your own PROFIBUS network
- Basics of process control – typical components, a simple overview of three-term control, practical operation and set-up of PID control loops
- Basic measurement techniques, level, flow, temperature and pressure, including principles of operation, installation, connections, basic application and set-up

**4-6 participants per course**

*“Great teacher, very helpful and great training facilities. By far the best I’ve come across.”*

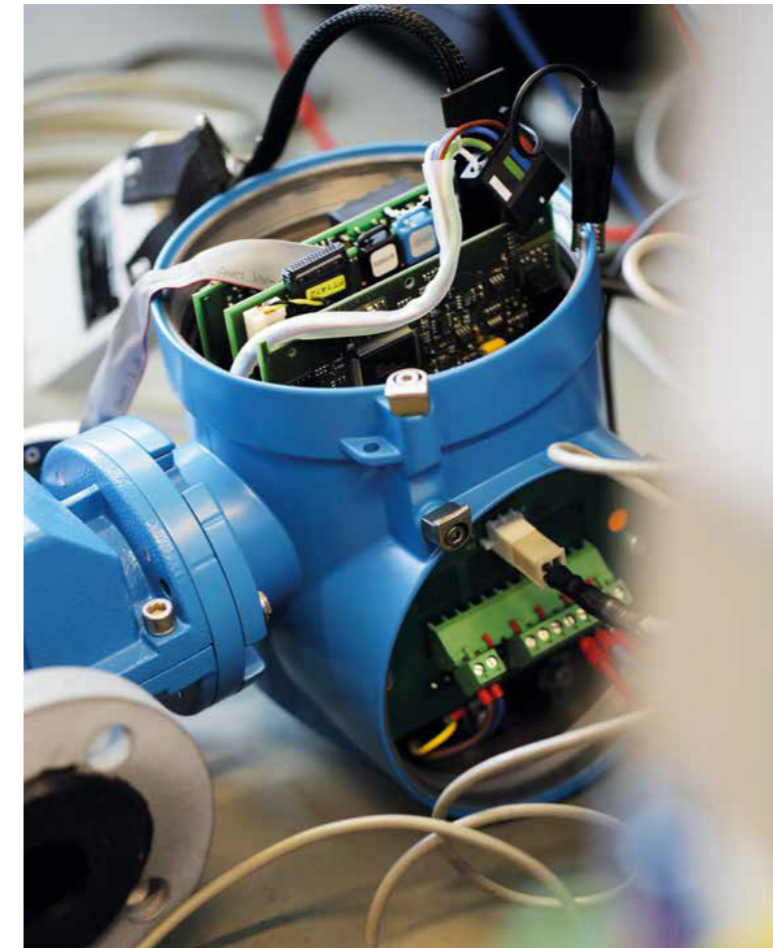
*“I found the training facility fantastic and the trainer was very thorough and answered all questions. Really enjoyed the course and the information given will help with my day to day role. I would like to come back and complete some more of the advanced courses.”*



Call 0161 286 5193 or email [sophie.cotton@uk.endress.com](mailto:sophie.cotton@uk.endress.com) for more details or to book your place

## Bespoke courses

Aimed at the more experienced engineers, we offer these courses to study specific topics in more details according to your specific needs. The content is subject to discussion and will be customised. While the courses tend to be product specific, they typically include:



- Two-day hands-on course on Time-of-Flight; one day on Guided Wave Radar and one day on free space, including mappings and parameters setting
- Density measurement and viscosity measurement using Coriolis meters using a multimeter and test equipment
- Steam flow measurement using vortex meters
- The use of diaphragm seals for pressure transmitters
- Advanced analysers
- Heat metering systems with flowmeters and flow computers
- Gas mass flow measurement with flowmeters and ancillary temperature, pressure transmitters and flow computers

**4-6 participants per course**

## PID Loop Tuning course

This two-day course is available to study PID loop tuning and process control. It is designed to develop understanding of PID control and to develop skills to optimise control loops and even integrate PID function blocks into a PLC.

### **PID Loop Tuning**

This two-day course covers the principles, structure and terminology of controllers and control elements. Simple tuning is also covered. Those attending will be able to understand, operate and adjust a range of PID controllers to achieve the specified performance.

**8 participants per course**



## EMC awareness for Industrial Automation Systems

This course aims to provide key players with the knowledge to make informed decisions during the design, installation and commissioning phases and ensure reliability of associated industrial networks and control systems.

EMC is an interesting subject bringing many misconceptions and challenges for both experienced technicians and engineers alike. This is not a new topic but in the world of industrial automation, the use of switching devices such as variable speed drives, whose switching frequency is likely to increase in the future, makes the likelihood of sporadic production outages due to the effects of EMC more likely.

Whilst it is not possible to provide an in-depth knowledge of EMC in one day, the course suggests the minimum best practices required for the mitigation of EMC-related issues in industrial automation environments.

**It is a prerequisite to have a basic electrical knowledge.**

## Certified PROFIBUS Installer course

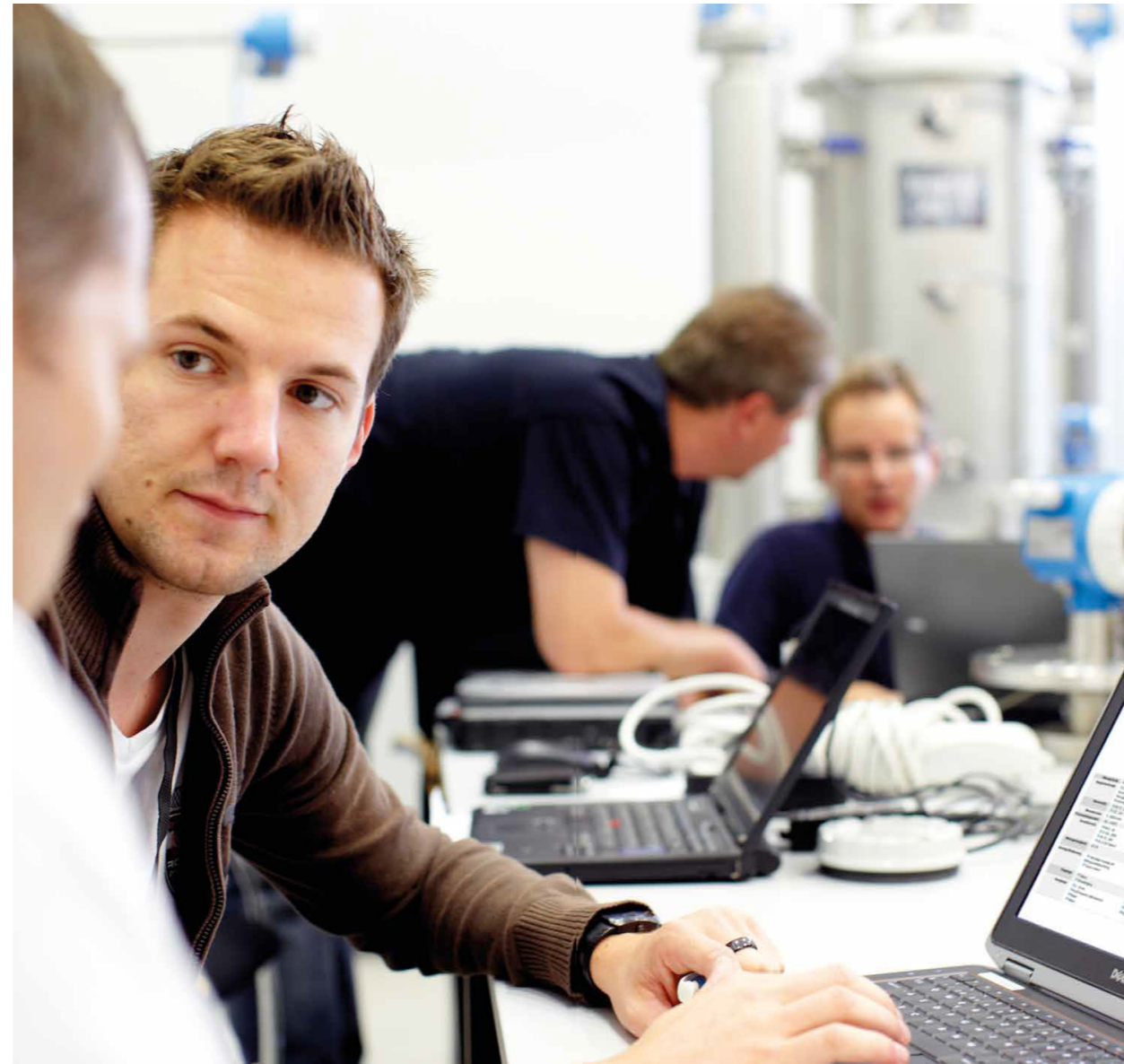
An internationally accredited introductory course for PROFIBUS installers and all other people involved with PROFIBUS at a technical level.

This one-day course teaches the layout, installation and testing of complete PROFIBUS networks. The course provides a practical, hands-on approach to fieldbus network layout and installation and covers the essential requirements for a successful and maintainable PROFIBUS network. The course covers:

- Basic PROFIBUS DP and PA network technology
- Common wiring and layout pitfalls
- Network and segment size and layout limitation
- Considerations for network maintenance and commissioning
- Correct use of repeaters, couplers and components
- Wiring and installation testing and use of bus test tools

**14 participants per course**  
**10% discount for UK PROFIBUS group members.**

**It is a prerequisite for the Certified PROFIBUS Systems Design and Engineering courses.**



## PROFIBUS Commissioning and Maintenance course

This one-day course is an add-on to the Certified PROFIBUS Installer and covers the practical techniques of fault-finding on operational PROFIBUS networks.

This is a practical course based around a working PROFIBUS network. Equipment includes a rack of devices and laptop with ProfiTrace Ultra for PROFIBUS device exercises and fault-finding. Techniques taught include:

- The use of PROFIBUS Ultra to diagnose network faults, device faults and I/O problems
- The use of the built-in digital storage oscilloscope to diagnose faults
- How to interpret diagnostic messages

**14 participants per course**  
**10% discount for UK PROFIBUS group members.**

## Certified PROFIBUS Engineer course

An internationally accredited course covering PROFIBUS network design, commissioning and live fault-finding.



This four-day course is designed for engineers with a thorough basic knowledge of PROFIBUS or other fieldbus systems. It covers the detailed theory of PROFIBUS DP and PA network operation. You will learn how to design, install, commission and troubleshoot PROFIBUS networks and how to use modern diagnostic tools, detect faults and identify their causes.

**It is a prerequisite to have completed the Certified PROFIBUS Installer course.**

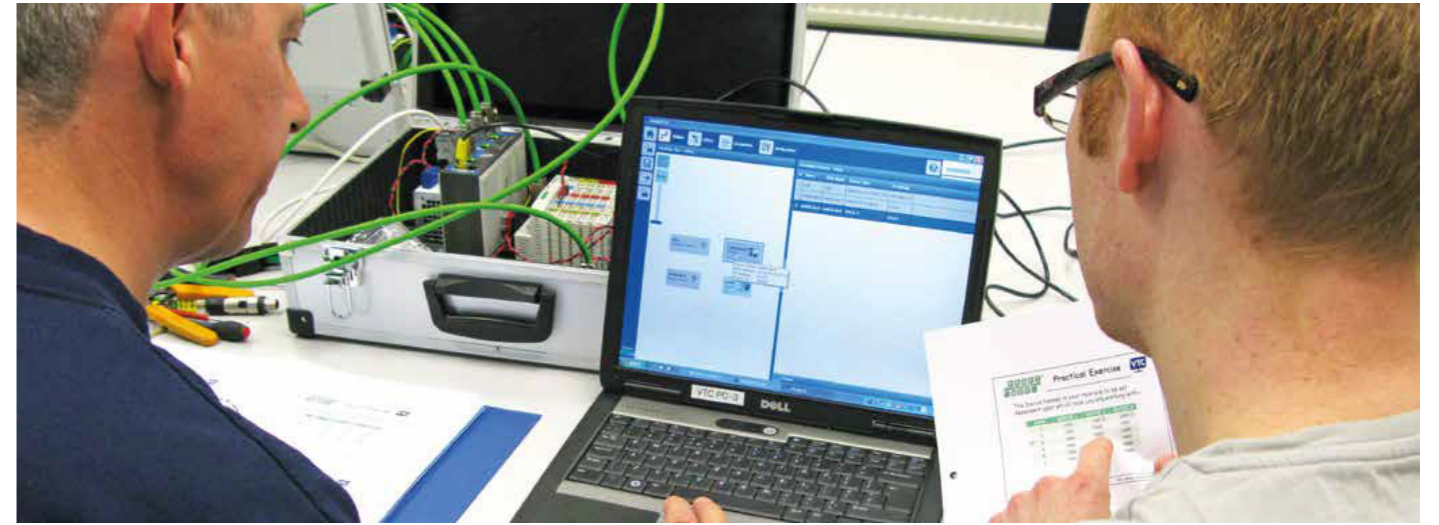
### You'll learn about:

- Telegrams that pass between PROFIBUS devices
- How the network deals with conflicts and other errors
- How to use modern tools including a high speed analyser
- The effects of failed devices, wiring and layout faults

**14 participants per course**  
**10% discount for UK PROFIBUS group members.**

## Certified PROFIBUS System Design course

The course is aimed at anyone involved with the design, specification or procurement of modern automation or control systems at the engineering level.



This three-day course covering the optimal design of PROFIBUS automation and control systems.

**It is a prerequisite to have completed the Certified PROFIBUS Installer course.**

### Course content includes:

- General system design.
- PROFIBUS network layout and design.
- PROFIBUS profiles.
- Hazardous areas.
- High availability systems and redundancy.
- Safety related systems.
- Control system and network timing.
- Modern solutions for network monitoring.

**14 participants per course**

## Certified PROFINET Installer course

The Certified PROFIBUS Installer course is a practical one-day course that teaches the layout, installation and testing of PROFINET networks. Although based on PROFINET technology, the course is equally well suited for any industrial Ethernet layout and installation. The course covers the basics of Ethernet and PROFINET communication and the rules for layout and installation. It covers many of the common but costly pitfalls that are found in many industrial Ethernet systems.

14 participants per course

## PROFINET Commissioning & Maintenance course

This one-day add on to the Certified PROFINET Installer course covers the techniques and tools used for configuration, health checking and fault-finding on PROFINET systems. The course is very practical in nature, with attendees having their own devices and laptop computer for practical exercises. The technical details of PROFINET start up and operation are not covered (these are covered in-depth on the Engineer course), but attendees will understand how to set up, verify and locate errors in networks.

14 participants per course



## Certified PROFINET Engineer course

PROFINET has become the leading industrial Ethernet standard in the market with a wide range of solutions for factory automation, high speed robotics and process control.



This four-day course that is aimed at engineers working at a technical level in automation or control systems.

Although the course is focused on PROFINET, the content is relevant to other industrial Ethernet technologies.

**It is a prerequisite to have completed the Certified PROFIBUS Installer course.**

Course content includes:

- Basics of Ethernet
- Network addressing
- Network infrastructure
- Network diagnostics
- Configuring a PROFINET system
- Ethernet and PROFINET frame analysis
- Controller and device start-up sequence

14 participants per course

## CompEx courses

With over 60 years' experience in the design and manufacture of field instrumentation, Endress+Hauser is a process safety expert. We have more than 250 certified product lines, complete with a SIL instrument and intrinsically safe device portfolio for safety critical applications and hazardous areas. We know that process safety depends on having the right measurement technology applied to the right application and used in the right way.

### Benefits

- CompEx training from the process safety experts
- The CompEx scheme is accredited by JT Limited (JTL)
- Eight dedicated training bays for practical training and assessment

### What is CompEx?

CompEx is a training, validation, assessment and certification scheme for managers, engineers and technical operatives working in potentially hazardous or explosive atmospheres. Companies have a responsibility to their staff to ensure their safety – and the safety of the public – and to encourage health and safety best practice in the workplace.

### Potentially explosive atmospheres

Potentially explosive atmospheres are not only found in petrochemical plants and refining plants, they are also found in a wide range of industries including chemical, life sciences and food & beverage. Failure to ensure safe working practices in these environments could result in the ignition of explosive gases or dust clouds leading to injury or fatalities. As a result, CompEx is fast becoming a mandatory requirement for technicians and engineers on many plants, both onshore and offshore.



### The CompEx scheme

Jointly developed by the Engineering Equipment and Materials Users' Association (EEMUA) and the training provider JTL, the scheme is nationally recognised as the industry standard and supported by the Health and Safety Executive (HSE). The CompEx scheme is now recognised as a global solution for validating core competency of employees and contract staff working on equipment for use in potentially hazardous environments.

### ExF: Foundation

A nationally recognised certificate in the basic theory of hazardous areas. The CompEx foundation training module runs over two days and has been developed to provide a broad understanding of working in explosive atmospheres.

4 to 10 participants per course

### Ex01-Ex04: Gas & Vapour

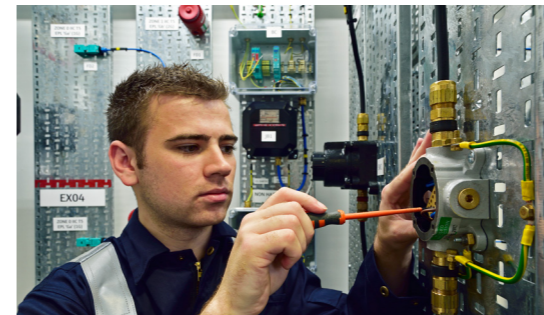
The underpinning knowledge and practical assessment programme is provided for electrical personnel who undertake the physical installation and assembly of new Ex equipment and who perform preventive maintenance and inspections on previously installed equipment. This 5-day course focuses on CompEx modules Ex01 to Ex04.

4 to 8 participants per course

### Ex14: Responsible Persons

Supported by the HSE, this 4-day course aims to assist Responsible Persons to meet their legal obligations with regard to maintaining an asset register and implementing a practical approach to the inspection and maintenance of equipment in explosive atmospheres utilising IEC 60079 Parts 14 and 17 and offering the basis of best practice.

4 to 10 participants per course



*“The CompEx scheme is now recognised as a global solution for validating core competency of employees and contract staff working on equipment for use in potentially hazardous environments.”*

*“Great course, excellent facilities and great tutors/assessors.”*

*“Enjoyed my Compex training course, the trainers were exceptional. Pace of the course was fast but that has to be expected due to the amount to take in.”*

Call 0161 286 5011 or email [tracey.stennett@uk.endress.com](mailto:tracey.stennett@uk.endress.com) for more details or to book your place





## Our Training Centre in Manchester

As the number one supplier of process instrumentation in the UK, Endress+Hauser recognises the need to provide high quality skills training in order to help you optimise the effectiveness of your instruments over a long working life.

Whether it's helping your staff understand the measurement principles or teaching advanced diagnostics and long-term asset management, we have the facilities and the expertise to work with you to meet all your training requirements.

In today's competitive marketplace, it's vital to have a well trained and motivated workforce. Investing in employees ensures the continued success of the company. Endress+Hauser has developed a suite of courses and content designed to help at all levels to ensure your staff are knowledgeable and competent to work on the valuable asset represented by your instruments and control equipment.

Our training team can come to you and deliver bespoke courses or you can visit us in our state-of-the-art training centre in Manchester.



### Our facilities in Manchester include:

- A 12-seater classroom fitted with state-of-the-art audiovisual (AV) equipment
- A purpose-built workshop allows you to get hands on with the equipment
- A central training and process area

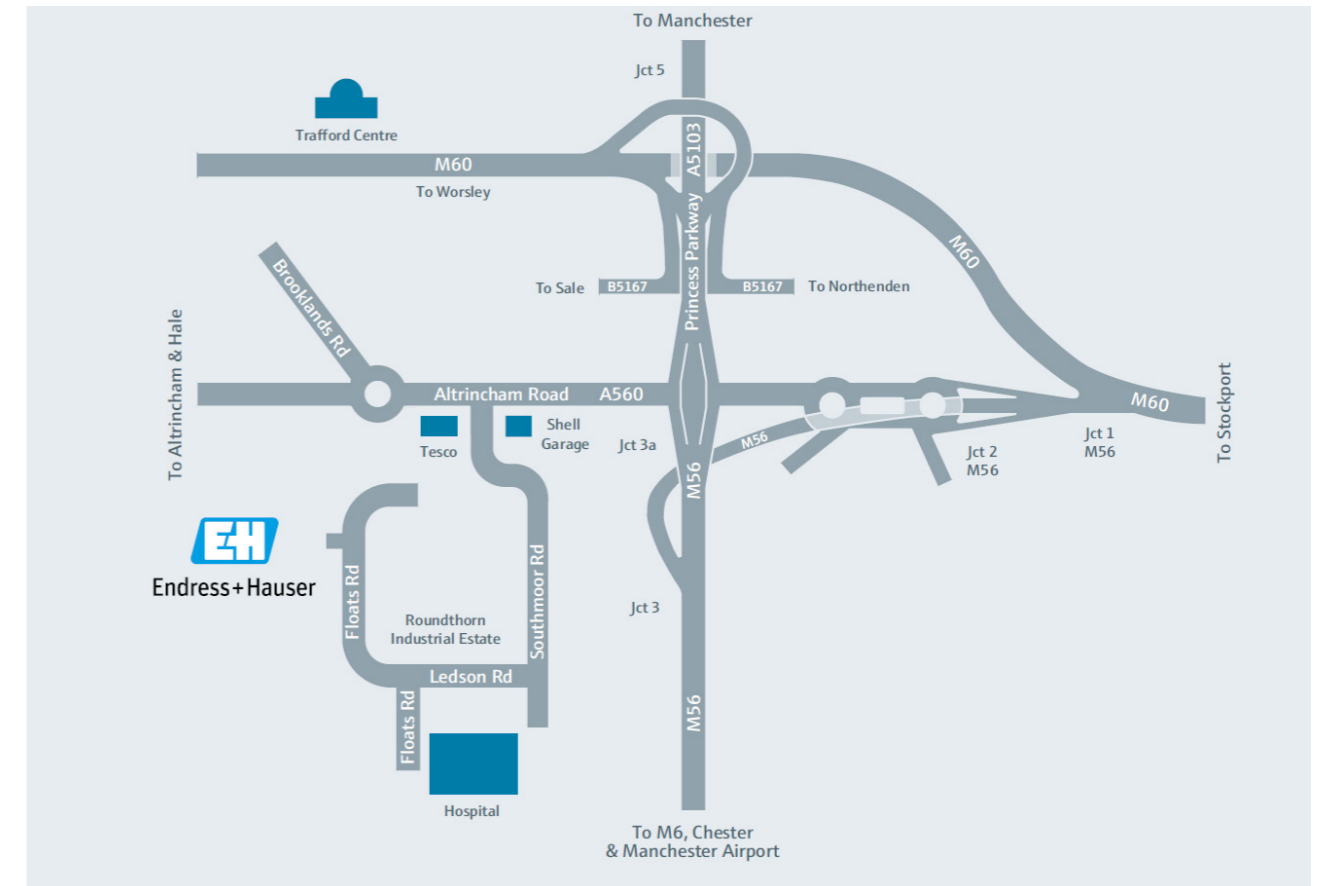
The main training area is designed to simulate a real process environment and comprises:

- A gas flow rig equipped with all common flowmeters, Rockwell Automation PLC and HMI, supporting PROFIBUS PA/Ethernet IP communication protocol
- A pressure rig for PID loop tuning using PROFIBUS PA protocol
- A batch control rig for liquid dosing, with traditional loop-powered/HART protocol
- A large process rig with various measuring techniques, drives, valves and process control
- Commonly used networks including PROFIBUS, Ethernet IP, 4-20mA HART and wirelessHART
- Central control room featuring Rockwell Automation HMI and PLC with process control and plant asset management facilities for all instruments in the training centre

We can also cater for up to 12 people to take a buffet lunch here, or alternatively you can enjoy the atmosphere of our in-house restaurant, Lausanne, where our chefs prepare a wide range of freshly-cooked meals daily and can cater for most special dietary needs.

## How to get to Endress+Hauser

The Endress+Hauser Business Park is located just 2 miles away from Manchester International Airport on Roundthorn Industrial Estate in Wythenshawe and situated only a few minutes from both the M56 and M60 motorway networks.





Temperature measurement  
More than meets the eye

Pressure measurement  
Helping you raise the bar

Come and visit us in Manchester to see our fantastic training centre first hand. Our modern, state-of-the-art facilities offer both theoretical and practical, hands-on training. Our packages can be tailored to suit your needs and every single course is delivered by experts in the field.

All your training needs are catered for in one dedicated space:

- classroom
- hands-on training rigs
- workshop area
- meeting rooms
- restaurant

## UK

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