

Process training university

The complete instrumentation training experience





The complete training experience

Online, on-site and at the PTU®

THREE TRAINING AVENUES

1 **PTU**
(Process Training Unit)
Standard or customized hands-on training at any PTU

2 **ON-SITE**
Standard or customized hands-on classroom training at your facility

3 **WEB-BASED**
Process Training Portal, with instructional technical learning videos and virtual instructor-led training

 **Professional Development Hours** (PDH) are available with all courses and noted on certificates of completion. You can also earn CEUs on some courses.

Professionals in the process control industry are looking for quality training to help them with their daily responsibilities. The requirements for higher productivity are ever increasing, and many companies are faced with a growing need to train their next generation of employees.

At Endress+Hauser, we have the tailored training solutions you need.

We have unique courses built from over 60 years of instrumentation experience across a wide range of industries, and we have made the investments necessary to continuously improve our methods and capabilities. Including the ultimate in hands-on learning, the PTU® (Process Training Unit).



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Process Training Units

For an unrivaled hands-on learning experience

Our PTUs are full-scale, fully functional, working process skids with online instrumentation and controls. They are small-scale process plants featuring Endress+Hauser instruments with Rockwell Automation systems capable of providing your employees real-life simulations and hands-on experiences.

Participants of PTU training learn the application, installation, operation and diagnostic procedures of various instrumentation. Plus, we are constantly upgrading and incorporating new methods to include the most up-to-date technology.



The Rockwell Automation Plant PAX system controls the PTU by actuation control valves with providing operators with real-time views of the process and continuous monitoring of critical parameters.



us.endress.com/rockwell



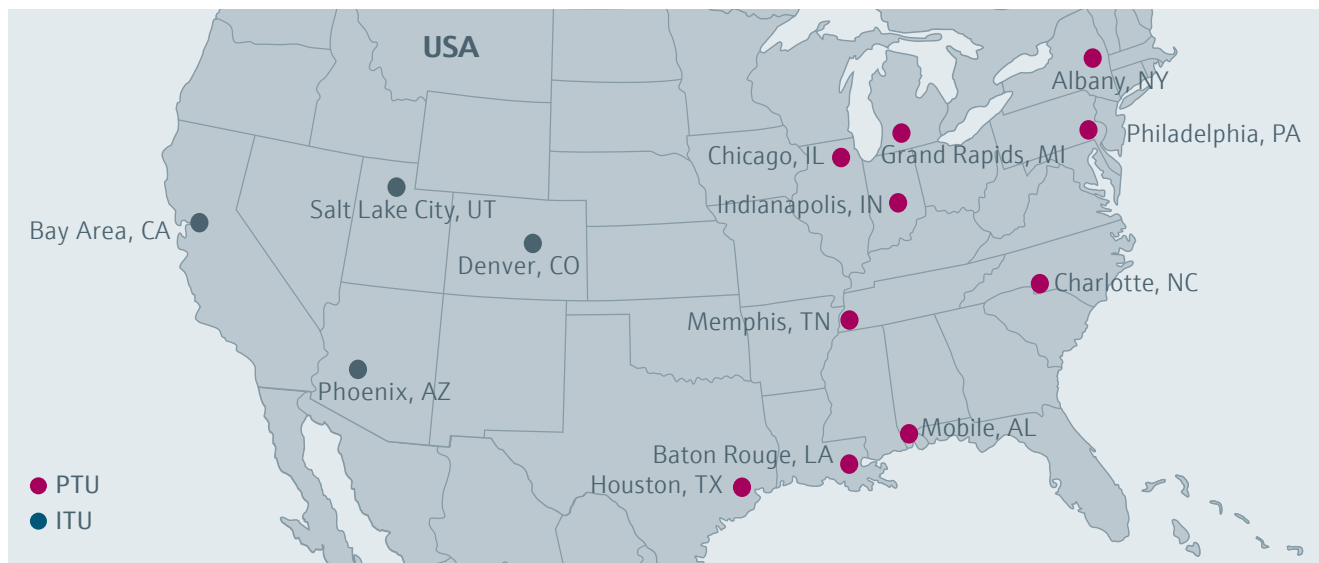
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Process Training University Campus Network

Endress+Hauser, in collaboration with its representative partners, maintains 10 process training units (PTU) and

four instrument training units (ITU) across the United States. Please see the map below for the location nearest you.



- Endress+Hauser, Indianapolis (Greenwood), IN
us.endress.com/training-schedule
- Vector Controls, Houston (Pearland), TX
vectorcag.com/vector-university
- Forberg Smith, Grand Rapids, MI
forberg.com/training/forberg-training
- TriNova Inc, Memphis, TN; Mobile, AL; Albany (Clifton Park), NY; Baton Rouge (Gonzalez), LA;
trinovainc.com/training-calendar
- Carotek, Charlotte (Matthews), NC
carotek.com/process-training-registration
- Eastern Controls, Philadelphia (Edgemont), PA
easterncontrols.net/training-capabilities
- G.E. Booth, Chicago (Romeoville), IL
gebooth.com/training
- Rust, Salt Lake City, UT; Bay Area, CA; Denver, CO
rustco.com/service
- Instrumentation and Controls, Phoenix (Chandler), AZ
instandcontrols.com/courses

Virtual PTU



Take a look inside our Houston (Pearland), TX process training unit to see the instrumentation and processes we use for your training needs. Each PTU location is unique to replicate the processes and industries in the area.



[Virtual PTU](#)





Course catalog

Whether you decide to standardize or customize, Endress+Hauser has the curriculum to get your personnel on their way to becoming experts in your process. These training opportunities are available at our PTU locations or at your facility. We can execute a standard offering or customize a course that works for you based on the topics covered.

Standard Training Courses

I-101: Basic Instrumentation School (16 hours/2 days)

This hands-on introductory course to instrumentation starts by providing maintenance and engineering personnel with a basic understanding of wiring, signals, instrumentation technologies, applications and installations. Fundamental operation of the common instruments found in today's process industries is examined from a view applicable to virtually any manufacturer's equipment. Typical troubleshooting procedures for instrumentation are covered and practiced.

Topics	Hours
Introduction to industrial instrumentation	04:00
Fundamentals of flow measurement technologies	04:00
Fundamentals of level measurement technologies	04:00
Fundamentals of pressure and temperature technologies	04:00

I-102: Loop Checkout & Troubleshooting Training (32 hours/4 days)

This course starts by providing maintenance and engineering personnel with a basic understanding of control loop fundamentals and basic process control theory. Following this introduction, instrument drawings are studied in detail, with a review of P&IDs. The course will include discussions of loop calculations needed at checkout and troubleshoot control loops, followed by actual hands-on exercises in the PTU. Participants will explore methodologies for loop troubleshooting and review test equipment used in loop checkout and troubleshooting.

Topics	Hours
Instrumentation and control loops	04:00
Temperature, pressure, level and flow measurement technique	20:00
pH and conductivity measurement and maintenance	08:00

Customized training on request

Build your own

Each topic covers:

1. Operation principles
2. Installation
3. Commissioning and labs
4. Troubleshooting and labs
5. Pre and post test

Requirements

- Minimum of 1 day (8 hours)
- Minimum charge of 4 participants
- Scheduled 6 weeks (minimum) out from order submission



[us.endress.com/en/
events-training/training](https://us.endress.com/en/events-training/training)



Flow

Module	Topics	Hours
F-200.1	Coriolis flowmeter	02:00
F-200.2	Magnetic flowmeter	02:00
F-200.3	Vortex flowmeter	01:30
F-200.4	Thermal mass flowmeter	00:30
F-200.5	Ultrasonic flowmeter	01:30
F-200.6	Data sources	01:00

Pressure

Module	Topics	Hours
P-200.1	Pressure fundamentals	01:00
P-200.2	Process pressure and sensor technologies	01:00
P-200.3	Hydrostatic pressure	01:30
P-200.4	Differential pressure	01:00

Level

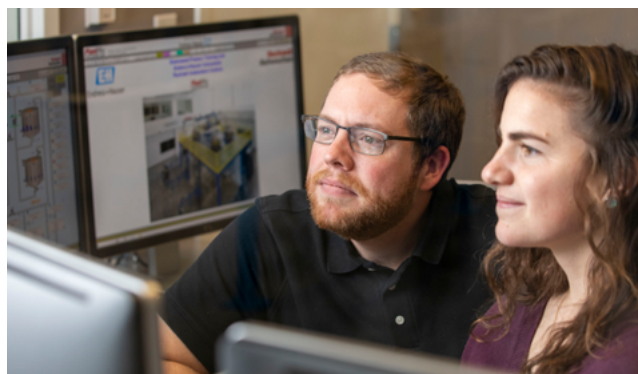
Module	Topics	Hours
L-200.1	Free space radar	02:30
L-200.2	Guided radar	01:30
L-200.3	Vibronics	00:30
L-200.4	Capacitance	01:00
L-200.5	Ultrasonics level	01:00

Temperature

Module	Topics	Hours
T-200.1	RTD assemblies	01:00
T-200.2	Thermocouple assemblies	01:00

System Products

Module	Topics	Hours
SP-200.1	Remote displays and systems components	01:30
SP-200.2	Data managers and field data manager software	04:00
SP-200.3	Energy managers	01:30
SP-200.4	Batch controllers	01:00



Liquid Analysis

Module	Topics	Hours
LA-200.1	pH/ORP	02:00
LA-200.2	Conductivity	02:00
LA-200.3	Dissolved oxygen	02:00
LA-200.4	Disinfection	04:00
LA-200.5	Water sampling	08:00
LA-200.6	Turbidity/TSS	04:00
LA-200.7	Ion-selective measurement (CAS40D)	04:00
LA-200.8	Sludge interface level (CUS71D)	02:00
LA-200.9	Single wavelength UV (CAS51D)	02:00
LA-200.10	Inline photometer	02:00
LA-200.11	CA80xx Single parameter analyzer + CAT8x0 Sample preparation	12:00
LA-200.12	CA80TP (Total phosphorous analyzer)	08:00
LA-200.13	CA72TOC (High-temp total organic carbon analyzer)	12:00
LA-200.14	CA76Na (Sodium analyzer)	04:00

Optical Analysis

Module	Topics	Hours
OA-200.1	SS500/SS2000	4:00
OA-200.2	J22	4:00
OA-200.3	OXY5500	2:00
OA-200.4	RXN Fundamentals	4:00

Digital Solutions

Module	Topics	Hours
DS-200.1	Introduction to digital communications	01:00
DS-200.2	Device configuration software and tools	01:30
DS-200.3	Fundamentals of HART and WirelessHART	02:00
DS-200.4	Fundamentals of Modbus RS485 and Modbus TCP	01:30
DS-200.5	Fundamentals of Foundation Fieldbus	01:30
DS-200.6	Fundamentals of Profibus DP/PA	01:30
DS-200.7	Fundamentals of IO-Link	01:30
DS-200.8	Industrial ethernet overview (PROFINET, EtherNet/IP and beyond)	01:00
DS-200.9	Fundamentals of PROFINET and APL	02:00
DS-200.10	Fundamentals of EtherNet/IP and APL	02:00
DS-200.11	Endress+Hauser in the Rockwell environment	02:00
DS-200.12	Fundamentals of OPC UA	01:30
DS-200.13	Netilion: Endress+Hauser's cloud ecosystem	02:00
DS-200.14	Trends in IIoT and Industry 4.0	01:00
DS-200.15	Remote support capabilities from Endress+Hauser	01:30

Cancellation of registration for an Endress+Hauser Training course less than 14 days prior to the start date is subject to a cancellation fee of up to 50% of the course fee.



Virtual learning on your schedule

On-demand access to technical learning content to enable your workforce to be productive and competent 24/7

Businesses know that a highly-trained workforce is their most valuable asset. However, oftentimes employers do not have the resources to produce a consistent training program that can be adequately delivered to employees that are working many different shifts in several different locations. Furthermore, the costs of administering a program internally can be prohibitive.

Fortunately, Endress+Hauser has developed an online training platform that can be delivered anytime, anywhere.

Advantages to online training

- Reach employees quickly, efficiently and economically
- Guarantee consistent delivery of training messages
- Reduce new-hire orientation time
- Prepare employees for hands-on training opportunities



us.endress.com/virtual-training



Virtual instructor-led training

As industry continues to utilize manufacturers' remote services for support, many are considering this to be a new normal way of operation.

Utilizing remote services has become a good alternative to on-site visits and has generated cost savings.

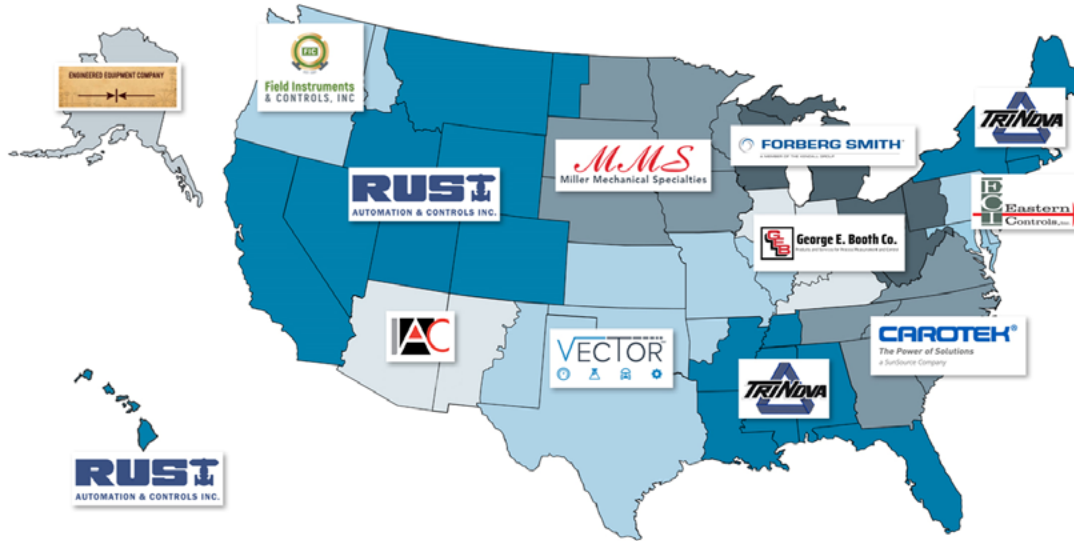
Endress+Hauser has expanded its training capabilities to include virtual trainings from the PTU® (Process Training Unit) to support customers in the most convenient and efficient way.



Free	Free	Free	Paid
Instructional Videos <ul style="list-style-type: none"> Animation of instrument technologies 	How-to Videos <ul style="list-style-type: none"> Youtube videos by Endress+Hauser experts Quick setup guides 	Process Training Portal <ul style="list-style-type: none"> Learning modules covering many of Endress+Hauser's products Free account and access to browse catalog of over 100 modules (Formerly End User Academy) 	Technical Learning Videos <ul style="list-style-type: none"> Featured Courses <ul style="list-style-type: none"> Installing Wiring Programming Troubleshooting Benefits <ul style="list-style-type: none"> Assessments Learning records in the Learning Management System Instructor-led classroom records Easy online purchase with credit card
us.endress.com/online-free	youtube.com/@endresshauser/playlists	us.endress.com/online-training	us.endress.com/online-training



Authorized service providers



Authorized Service Provider	PTU	ITU	Location	Website
Carotek, Inc. NC, SC, VA, GA, TN	✓		700 Sam Newell Rd Matthews, NC 28105	Carotek.com/training
Eastern Controls, Inc. PA, MD, DE, NY, NJ	✓		3866 Providence Rd Edgemont, PA 19028	Easterncontrols.com/home/training
Field Instruments & Controls, Inc. WA, OR, ID			7509 S 5th St. Ste 112 Ridgefield, WA 98642	Fieldinstruments.com
Forberg Smith MI, WI, OH, PA, WV, KY	✓		3838 Clay Ave SW Wyoming, MI 48548	Forbergsmith.com/training
G.E.Booth IL, IN, KY, OH	✓	✓	8202 E 10th St. Indianapolis, IN 46214	Gebooth.com/training
Instrumentation and Controls AZ, NM			6829 W Frye Rd Chandler, AZ 85226	Instandcontrols.com/courses
RUST Automation and Controls CA, CO, HI, MT, NV, UT, WY, ID, ND		✓	8070 S 1300 West West Jordan, UT 84008	Rustco.com/service
TriNova, Inc. AL, AR, CT, FL, LA, ME, MA, MS, NH, NY, RI, TN, VT	✓		4485 Laughlin Dr S Mobile, AL 36693	Trinova.arlo.co
Vector Controls TX, NM, OK, AR, KS, MO, IL	✓		14517 Kirby Dr Pearland, TX 77047	Vectorcag.com/vector-university
Endress+Hauser	✓		2350 Endress Pl Greenwood, IN 46143	US.endress.com/training

www.addresses.endress.com
