

# Tailor-made field instrumentation

## Measurement and control in the process industries



# Welcome to Endress+Hauser!

If someone asks me what makes Endress+Hauser so successful, I reply: “Our principles”. It is the way in which we align our company, how we do business and how we relate to each other.

Our ultimate goal is to create outstanding value for our customers. We intend to achieve this by our presence in sales, services and production worldwide and through our wide range of instruments, services and solutions that are tailored to the requirements and needs of the market and customers.

We want to be a competent and reliable partner for our customers. We don't intend to sell them merely products but to work with them to find the best solution, as this is a precondition of successful long-term partnerships.

As a family enterprise, Endress+Hauser's culture is characterized by trust and responsibility. On this basis, I gladly invite you to get to know us. Discover how we can support you in the area of process instrumentation and see for yourself that we really are the “People for Process Automation”!

Klaus Endress  
CEO of the Endress+Hauser Group



**We rely on strong values** Since its foundation in 1953, Endress+Hauser has developed from humble beginnings to an international provider of process instrumentation. Customers all over the world trust in the knowledge and skills of our 8,800 employees. They rely on the culture of a family enterprise. The core of this “Spirit of Endress+Hauser” is responsibility and trust, reliability and cooperation – strong values which make us believe in a successful future.

Long-term objectives and sustained success characterize our strategy. Our sound equity capital base provides the security that we will be able to pursue it consistently – as a successful family-owned company.

# The right solution for every task

**Whatever you need to measure: we have the right solution for every task. Our comprehensive portfolio of instruments, services and solutions will help you to operate your processes in a safe, reliable, environmentally compatible and cost effective manner.**

**We speak your language** Be it precision, robustness, specific design needs or efficiency: every industry has its specific requirements of process instrumentation. Technical specifications and standards have to be met and often compliance must be proven by documents and certificates. Nobody is more aware of this than you. Therefore, you need advisors who know your business and the competitive environment. People who speak your language.

Comprehensive knowledge of the processes of our customers is the beginning of every successful partnership for us. This is the only way in which we can discuss matters with you on an equal footing and find the best solution for your measuring tasks. We want to help you to stay successful and become even more successful. Trust in the know-how that we have gained over decades of working in many industries and applications!

Our field instruments use numerous measuring principles and model variants to meet all your requirements. Our considerable experience in the most varied communication systems helps us to integrate them into almost any environment. One of our principles reads: We adapt our instrumentation to the respective measuring point – and not vice versa. We make our offering based on price and performance. It is immaterial whether your process requires the highest degree of accuracy or economic efficiency – you will always receive the highest level of quality.

**We are where you are** Wherever you are, we are close by. Our sales centers ensure distribution and services worldwide. Representatives and partners complete this close-knit network.

Product centers in 11 countries combine our know-how in research, development and production. They ensure that your wishes are fulfilled in a fast, flexible and, above all, timely manner. And they surprise people again and again with groundbreaking new solutions. More than 3,600 current patents and patent applications demonstrate the inventive spirit and creativity of our developers.



 Endress+Hauser:  
[www.us.endress.com](http://www.us.endress.com)

# Level

## Continuous level measurement and point level detection

Visionary concepts in the development of new products produce innovative solutions that meet the challenges of tomorrow yet can be integrated into the new automation systems of today.

Since 1953, Endress+Hauser has been manufacturing level measurement devices for industrial use in liquids and bulk solids of all kinds. During this time a number of different methods for level measurement or point level detection have been developed and constantly optimized.

Today you have at your disposal the most up-to-date measuring systems in a variety of designs with variable process connections and matching interfaces. All measuring devices have industry-specific and safety-relevant certificates and approvals.



Level website:  
[www.us.endress.com/Level](http://www.us.endress.com/Level)





**Radar**

Continuous non-contact Time of Flight measurement in liquids, even under extreme conditions such as changes of medium, gas formation, vapor, vacuum.



**Ultrasonic**

Continuous non-contact measurement in liquids and bulk solids. Independent of specific medium properties.



**Guided radar**

Continuous non-contact Time of Flight measurement in liquids and bulk solids. Independent of product properties such as humidity, density, dielectric constant, etc. Reliable and safe interface measurement even with emulsion layers.



**Radiometry**

Non-contact external measurement. For all extreme applications (e.g. toxic or highly aggressive media).



**Vibronics for liquids**

Point level switch for all liquids even in the presence of build-up, turbulence or air bubbles. Independent of the electrical properties of the medium.



**Vibronics for solids**

Point level detection in all kinds of bulk solids up to a maximum grain size of approx. .40 in. Calibration-free, maintenance-free.



**Hydrostatic**

Level optimized pressure sensor cell for measurement in liquids, pastes and sludges. Independent of foam formation and changing product properties.



**Differential pressure**

Level measurement in closed, pressurized vessels. Not affected by dielectric constant, foam, turbulences or obstacles.



**Capacitance**

Point level detection and continuous level measurement in liquids and bulk solids. Even with aggressive media and heavy build-up; condensate-proof.



**Conductive**

Easy, cost-effective level limit detection in conductive liquids such as water, wastewater, liquid foodstuffs etc.



**Soliwave Microwave barrier**

Through the use of a microwave beam emitted through non-metallic surfaces, the Soliwave microwave barrier can detect the presence of bulk solids in a plugged chute (typical application), container or conduit.



**Electromechanical level system**

Robust, mechanical system for measurement in bulk solids for applications in high vessels (up to 300 ft/70 m). Unaffected by heavy dust formation.

# Pressure

## Measurement of process pressure/differential pressure in acids, sludges, gases or vapors

The fields of application for pressure measurement these days are varied, ranging from food and pharmaceuticals to water and wastewater, chemicals, paper production and power generation. Pressure sensors ensure safety and supply important process data. In many cases pressure and differential pressure measuring techniques are used for level and flow measurement. This makes pressure one of the most important measured variables in process automation. For Endress+Hauser this is an incentive to forge ahead with advances and improvements in the development and production of high quality pressure measurement.

Endress+Hauser's wide range of devices for pressure measurement enable us to offer a pressure transmitter with ultra-modern technology and high quality materials for every application and every budget.

Whether acids, sludges, gases or vapors – a pressure device is generally located where all the action is. Sensors have to satisfy the highly specific requirements of the applications from the initial development phase to final finished production. It takes more than just an understanding of physics to develop and produce the most important link with the process.

For more than 20 years, Endress+Hauser has been developing and manufacturing pressure measurement and sensor technology for a wide variety of applications. Many of these solutions are unique to the market.



Pressure website:

[www.us.endress.com/Pressure](http://www.us.endress.com/Pressure)



### Transducer

A compact pressure transducer with preset measuring range. The range offers robust ceramic sensors up to 600 psi or metal sensors up to 6000 psi for absolute and overpressure measurements.



### Pressure switch

For safe measurement and monitoring of absolute pressure and overpressure in gases, vapors, liquids and dusts. Smooth operation with display and on-site operation as well as a modular adapter system for easy connection to all processes.



### Process transmitters

Tailored to your application and through our unique U.S. manufacturing capabilities, we can easily meet your needs for continuous measurement, absolute pressure and gauge pressure in gases, steams or liquids.



### Electronic Differential Pressure

The only solution to replace costly capillary lines, thus eliminating issues due to shift in temperature, condensation, or line imbalances. Easily replace individual spare parts, lowering the cost of ownership.



# Flow

## High performance instruments for the flow measurement of liquids, gases and steam

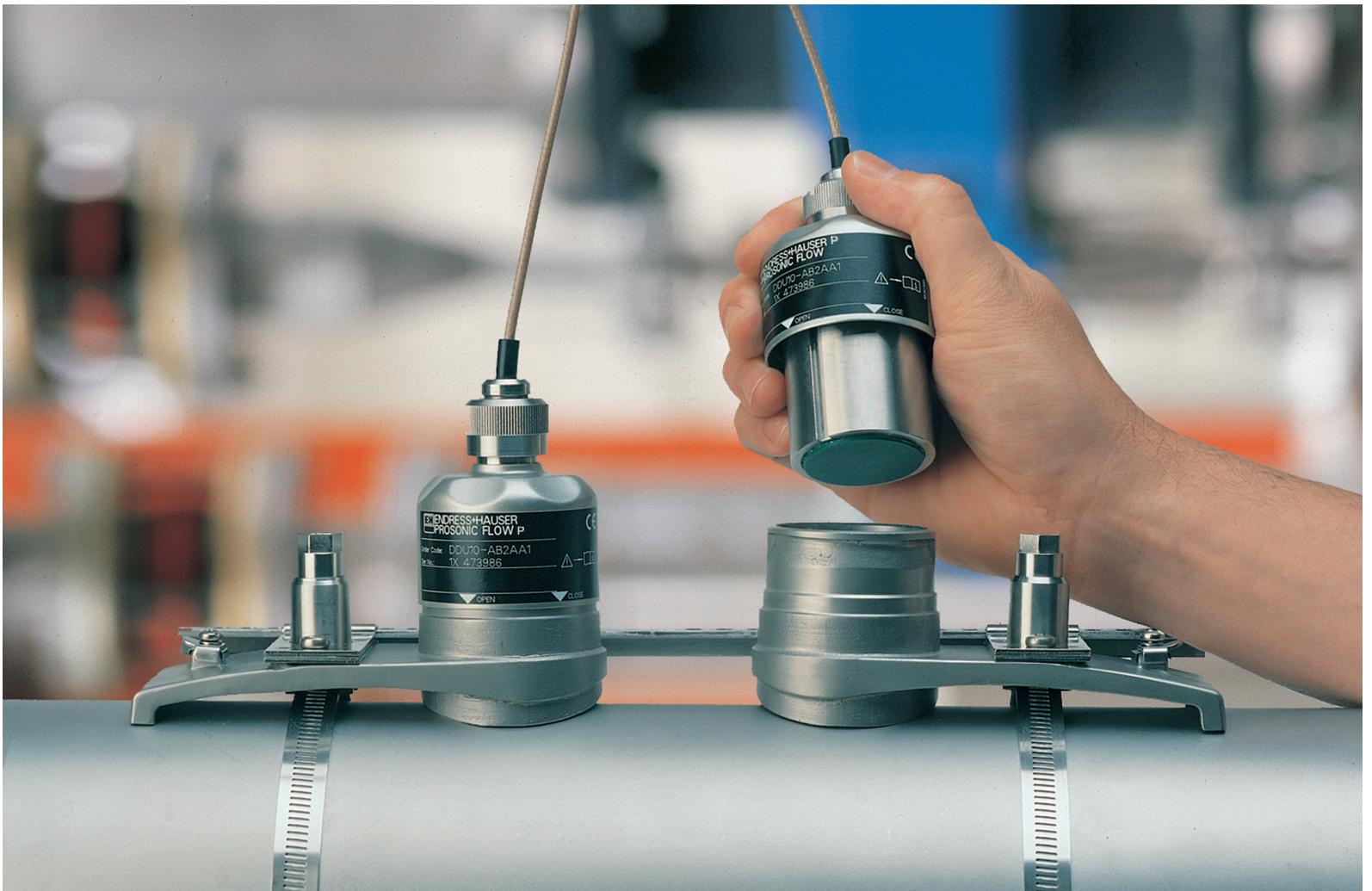
Plant safety, constant product quality, process optimization, environmental protection – these are just a few key aspects which demonstrate why flow measurement of liquid, gas and steam is playing an increasingly important part in industrial measurement technology.

Water, natural gas, steam, mineral oil, chemicals and wastewater are only some examples of fluids that have to be measured day in, day out.

Endress+Hauser supports you with modern high quality application-oriented flow measurement devices for dosage, filling, control or recording in almost all industrial sectors and applications.

High accuracy, reliable operation, easy start-up and low maintenance costs are just a few of the qualities you can always rely on with flow measurement devices as a customer of Endress+Hauser.

 Flow website:  
[www.us.endress.com/Flow](http://www.us.endress.com/Flow)





#### Electromagnetic

Universal measuring principle for all conductive liquids. Virtually independent of pressure, density, temperature and viscosity. Even solid-containing liquids can be measured, e.g. ore slurry, cellulose pulps.

Sizes: ½" to 90"



#### Coriolis

Universal measuring principle for liquids and gases. Multivariable sensors: simultaneous and direct measurement of mass flow, density, temperature and viscosity. Independent of the physical fluid properties.

Sizes: ¼" to 16"



#### Ultrasonic

Volume flow measurement of clean liquids or wet biogas. Liquid version in either clamp-on or in-line sensor type. Ultrasonic measurement enables cost-effective and economical flow metering for process. Two-wire versions simplify installation concept.

Sizes: ½" to 160"



#### Thermal

Direct mass flow measurement of gases with low process pressure up to 600 psi. Measuring principle with a high turndown (100:1) and an excellent low-end sensitivity. Negligible pressure loss.

Sizes: ½" to 60"



#### Differential pressure (DP)

Universally applicable for liquids, gases and steam up to 6000 psi and 1800°F. Robust primary element as it is completely mechanical with no moving parts. The transmitter can be replaced during operation, e.g. for maintenance or modernization of the measuring point without interrupting the process.

Sizes: ½" to 160"



#### Vortex

Universally applicable for the measurement of liquids, gases and steam. Extremely robust with regard to external vibrations, dirt, water hammer and temperature shocks. Largely independent of changes in pressure, temperature and viscosity. High long-term stability, no zero point drift.

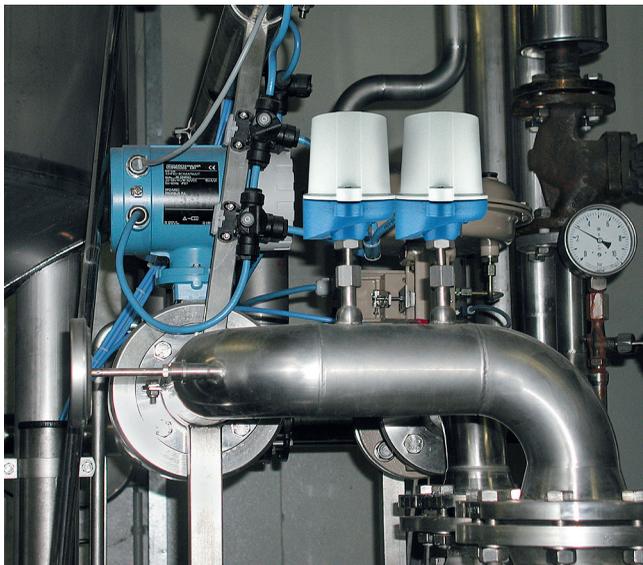
Sizes: ½" to 12".

# Temperature

## Sensors and transmitters for the process industry



Temperature is the most frequently measured variable in process engineering. For years now Endress+Hauser has been at the forefront of leading international companies in industrial temperature measurement with its own development and production centers in Europe, USA, Africa and Asia. Our products comply with international standards and specifications such as ATEX, FM, CSA, TIIS, IEC, NEPSI, SIL, NAMUR NE 21, NE 43, NE 89, NE 107 and GL are suitable for use in all sectors of industry.



The excellent price-performance ratio of our products and services provides a high degree of quality, reliability and safety, which is guaranteed to make you truly competitive. To this end we operate our own SIT+DKD certified and EC accredited calibration and testing laboratories for temperature measurement.



Temperature website:  
[www.us.endress.com/Temperature](http://www.us.endress.com/Temperature)

**Temperature transmitters** Choose from head, DIN rail or field mounted transmitters with RTD or thermocouple input and freely programmable measurement ranges. Whether analog output or HART® protocol, FOUNDATION fieldbus™ or PROFIBUS® PA interfaces, Endress+Hauser offers you the right solution for every occasion.



**Head transmitters**  
 Select models offer field transmitter capabilities in head transmitter foot print. The optional plug-on display can be used with an iTEMP TMT82, TMT84 or TMT85 temperature transmitter, simply plug it on to the transmitter.



**DIN rail transmitters**  
 For mounting rails ensuring safe, process-near transmission of the sensor signal.



**Field transmitters**  
 With on-site display (optional) for optimum safety and reliability requirements.

**Temperature sensors** We offer a wide selection of resistance thermometers (RTD) and thermocouples (TC) to suit every occasion. Our patented Sensor On Tip Technology (SOT) offers the best response times on the market - up to 6 times faster compared to conventional sensors. This provides optimum preconditions for exact and safe process control. Predominantly class A sensors or better are used for our resistance thermometers.



**Resistance thermometers**  
 A wide range of process connections, mineral-insulated conductors and replaceable measuring inserts are available. Also available in compact design with M12 or 7/8" plug-in connector for simple and safe connection.



**Thermocouples**  
 For measurements at high temperatures even under the most difficult conditions.



**Temperature switches**  
 For monitoring, display and regulation of process temperatures. Available with various process connections (standard and hygienic). The sensors can be used in measuring ranges from -60 to +400°F.

# Liquid Analysis

pH/ORP, conductivity, oxygen, turbidity, disinfection, nutrients, organic load



Liquid analysis is one of the most quality-relevant processing variables in the chemical, pharmaceutical, power, water and food industries. Reliable measuring points guarantee safe processes and high product quality. Endress+Hauser is the leading specialist worldwide for sensing techniques and analysis of pH, conductivity, turbidity and solids content, oxygen, chlorine, ammonium, nitrate and phosphate as well as other chemical components of fluids.

Ranging from single measuring points composed of sensor, process connection and transmitter to fully automatic measuring systems and application-specific engineering combined with ultra-modern communication technology – all the products are available from a single supplier.

The outstanding feature of these products is the innovative Memosens® technology. It makes the sensors digital with integrated data storage. All relevant calibration and operation data is saved in the sensor. Memosens® is the first non-contact measured value transmission from the sensor to the transmitter.

With the Memosens® sensors, Liquline transmitters and the Memobase sensor and data management, Endress+Hauser offers a revolutionary maintenance strategy. Thanks to centralized and convenient sensor monitoring, Memobase delivers higher product quality and reduces maintenance costs.

This success is only possible in close cooperation with our customers, research institutes and universities, which enable us to develop application-specific products in line with the latest technologies.

Perfect command of all technically sophisticated production steps coupled with a high degree of automation, puts Endress+Hauser in a manufacturing class of its own. For the customer this means extended sensor operating times, fewer maintenance cycles and maximum measurement accuracy even with extreme applications.



Liquid Analysis website:  
[www.us.endress.com/Analysis](http://www.us.endress.com/Analysis)



#### pH/ORP

With glass electrodes and glass-free sensors (ISFET) employing Memosens® technology, we offer a complete sensor family for all applications. Transmitters are also available as an explosion proof version, with assemblies for a wide variety of uses and fully automatic measuring systems.



#### Conductivity

Conductive sensors with Memosens® technology and inductive sensors for all measuring ranges; transmitters are also available as an explosion proof, integrated measuring system, calibration system.



#### Turbidity/Solids

Optical sensors based on the Memosens® technology using the 90° scattered light method and sensors using the 4-beam pulsed light method for lowest to high concentrations, zone-tracking optoelectronic and ultrasonic measurement of sludge levels.



#### Dissolved Oxygen

Amperometric and optical sensors with Memosens® technology for continuous measurement of the concentration of dissolved oxygen in water supply and for oxygen trace measurement.



#### Chlorine

Total chlorine and free with Memosens® technology for disinfection in the treatment of drinking water and swimming pools. Flow assembly for simultaneous measurement of chlorine and pH/ORP.



#### Analyzers

Photometric and ion-selective analyzers for water and wastewater control processes to ensure quality and optimize costs. They monitor nutrients, organic load as well as metals and are available as in-situ and cabinet systems.



#### Transmitters

Extra large display with plain text operation via navigator and softkeys, flexible module concept; 4-wire multichannel and multiparameter device; 2-wire device as explosion proof, housing made of plastic and stainless steel, HART®, PROFIBUS®, FOUNDATION™ fieldbus.



#### Assemblies

Immersion assemblies and built-in assemblies with all conventional process connections, automatic retractable process assemblies in various materials, also with hygienic approvals, even with fully automatic calibration and cleaning of the pH measuring point.



#### Samplers

Portable and stationary samplers for automatic sample-taking, defined distribution and safe storage of fluid samples.

# Density and Concentration

## Quality measurement in liquids



Blending of preliminary, interim and final products, determining the exact density or concentration, monitoring quality and controlling process – all these activities constitute a reason for the density measurement of the fluid. Endress+Hauser offers the process-approved vibronic principle with an individually developed electronic for density measurement. This provides you with the possibility of determining density and concentration in a simple and fast manner across industries.



### Liquiphant

Large number of process connections to choose from. Suitable for hygienic applications. Units of density: norm density, °Brix, °Baumé, °Plato, % volume, concentration, etc. with 2D and 3D tables. Formula editor to calculate customer-specific units. Up to five Liquiphant density sensors can be connected to the density computer FML621. Direct installation in tanks and pipes.



### Coriolis – Promass

Maximum process dependability assured, since mass, density and temperature are measured simultaneously. Units of density: g/cc, SGU, lb/gal, kg/m<sup>3</sup>, SCF, Nm<sup>3</sup>. Special density units %mass, %volume, target and carrier flows, degree Brix, Plato, Baume, API or specialized function from direct measurement in pipe.



### Radiometric – Gammapiot

Straightforward retrofitting without process interruption; the pipes do not have to be opened. No maintenance necessary. Units of density: g/cm<sup>3</sup>, g/l, lb/gal, concentration, % mass, °Brix, °Baumé, °API, etc. Installation from outside through the pipe, in the bypass or tank.

# Interface measurement

## Suitable measuring principles for your individual interface application

Your application is of prime significance because the instrument serves the application and is only selected once the general setting is known. You get the optimum interface measurement solution in relation to your process requirements from us. Precise interface measurement is important in continuous and dynamic processes. Is the overall level constant or variable, and if so, in which range? Should the overall level be available as a measured value in addition to the interface measurement. Does emulsion occur during measurement?

The answers to such questions have a strong influence on the correct selection of instrumentation. We offer you transparency in relation to options, application limits and commissioning of the individual measuring principles. Guided radar, multi-parameter, capacitance instrumentation or radiometry – we support you in your application.

### Guided radar

As the pulses impact the medium surface, only part of the sending pulse is reflected. Especially in media with a low dielectric constant (DK), the other part penetrates the medium. As the signal enters the lower medium with a higher dielectric constant (DK) it is reflected once more. Taking the delayed Time of Flight of the pulse through the upper medium into consideration the distance to the interface is determined in addition. Applications up to 850°F / 6000 psi.



### Multiparameter

The name of the innovation in interface measurement is FMP55 Multi-parameter. This instrument combines the advantages of the capacitance and guided radar measuring principles. Emulsion layers may cause signal losses in interface detection in standard guided radar measurements. Only Levelflex FMP55 Multi-parameter can provide redundant technology to guarantee safe measured values for both the interface and the overall level with this unique, redundant measuring system. Applications up to 400°F / 600 psi.



### Capacitance

Media with a small dielectric constant (DK) cause very small changes of the capacitance value while media with a high DK produce respectively large capacitance changes in level measurement. In many interface applications, the medium with the smaller DK value is on top, e.g. in hydrocarbon on water. The upper medium merely provides a minimum contribution to the overall capacitance value – the issued level thus only refers to the water level (the interface). Applications up to 400°F / 1450 psi.



### Radiometry

The gamma source emits radiation which is attenuated as it penetrates the container wall and the medium. On the opposite side of the container, a detector converts the radiation received into an electric signal. The measuring effect results from the fact that different interfaces absorb (attenuate) the radiation differently. If the transmitter has been calibrated to the media by wet calibration once, a correlation to the measurement of the interface results automatically. Unaffected by process temperature and pressure.



# Services

Support for you throughout the life cycle of your plant



Calibration at customer's site.

With more than 60 years of experience in process instrumentation, and a network of certified Endress+Hauser service technicians – you can rely on us for the total support of your instrumentation. Endress+Hauser's services portfolio is comprised of a broad selection of services and tools for you to optimize your plant's performance.

- Startup
- Help Desk – available 24 hours a day
- Calibration
- Training
- Spare parts and consumables
- Factory repairs
- Field service
- Maintenance agreements

 Customer support & services website:  
[www.us.endress.com/services](http://www.us.endress.com/services)

 Process Training University:  
[www.us.endress.com/training](http://www.us.endress.com/training)



**Startup** Endress+Hauser service technicians perform set up of your instruments according to defined Standard Operating Procedures to ensure constant performance quality. Our teams use tools designed to ensure quick and efficient startup of instruments and confirm the function of the device through the delivery of standardized reports.

**Technical Support** Equipment failure can occur any time of the day – we provide support coverage whenever you need it. Our team of support engineers is available to offer technical phone support during setup of instruments to more complex troubleshooting issues.

**Training** Endress+Hauser, known for process control instrumentation and the solutions and services offered around those instruments, has been manufacturing instrumentation for over 60 years. We have taken that experience of instruments and the industries we serve and built it into training that helps our customers get the hands-on experience and knowledge they need. Our training packages are not merely limited to classroom and laboratory experiences, but have been broadened to include on-line training and on-site training as well. We have unique Process Training Unit™ facilities for a true hands-on experience.

**Calibration Services – On site and Factory Calibration services** Endress+Hauser offers accredited lab and field calibration. Endress+Hauser performs instrument calibrations across a variety of measuring principles. We even extend our calibration service to third party equipment to reduce time, effort and cost in terms of coordination and documentation. Calibrations are performed in compliance with ISO 17025.



**✓ PTU – Process Training Unit**  
 Fully functional “mini-process plants” feature Endress+Hauser instruments integrated with the PlantPAx process automation system from Rockwell Automation. Designed for educating field technicians and engineers with a unique learning experience through real-life simulations.

# Components, Systems and Solutions

As a supplement to our field measurement technology, Endress+Hauser offers components such as display devices, isolators or power supply units designed to complete your measuring point at field level. In addition we offer systems for optimum integration of field measurement technology into your system world, e.g. process control systems and solutions for production, logistics and maintenance,

throughout industry. Endress+Hauser is your partner, from sensor to process automation.



System components and recorders website:  
[www.us.endress.com/systemcomponents](http://www.us.endress.com/systemcomponents)



Solutions website:  
[www.us.endress.com/solutions](http://www.us.endress.com/solutions)

## Components

### WirelessHART™ gateway and adapter

Endress+Hauser's battery-powered WirelessHART™ adapter allows any 4–20 mA/HART® device to be integrated into a WirelessHART™ network. The gateway buffers the transmitted values and makes them available for external clients via an Ethernet or RS-485 interface.



### Fieldgate

Gateways with Ethernet interface to binary, 4–20 mA, HART®, PROFIBUS® or FOUNDATION™ fieldbus signals allow plant access to device parameters. Applications include monitoring, plant asset management or inventory management.



### Data Logger Minilog B

Measured data collector with analog and digital input for acquisition and storage of analog and digital values



### Paperless recorder and multi-channel display

Ecograph T is a state-of-the-art solution to multi channel displaying, recording, monitoring and communication needs.



### Memograph M Data Manager

Its high functionality, modular construction and intuitive operator concept allows this device to memorize, visualize, analyze and communicate process values as a stand-alone system or as an efficient system component.



## Systems

### Fieldbus

Endress+Hauser is a leading supplier of fieldbus instrumentation. Practically all of our instruments can be equipped with a HART®, PROFIBUS® or FOUNDATION™ fieldbus interface, selected ones with a serial MODBUS or EtherNet/IP™ interface. As intelligent instruments, fieldbus devices carry additional information from the field, e.g. instrument status, maintenance and diagnostics. They save operational costs by increasing plant availability and are significantly cheaper to install and commission.

### WirelessHART™

There are many applications where accessibility or installation costs rule out the use of a fieldbus as communication medium. WirelessHART™ offers an economical solution for these tasks: temporary installations, rotating equipment, moving equipment, remote and difficult to access measuring points. WirelessHART™ networks are self-organizing and self-healing and thus require no special knowledge for installation.

### FieldCare®

FieldCare® is Endress+Hauser's FDT-certified Plant Asset Management tool, providing a range of functionality from simple device parametrization to Condition Monitoring solutions. It configures all HART®, PROFIBUS®, and FOUNDATION™ fieldbus devices in your plant and supports you in managing them. By using status information, it also provides a simple but effective means of checking their health. Third-party devices without FDT support can be integrated using the optional iDTM-HART® and iDTM FOUNDATION™ fieldbus plug-ins.

### Field Xpert™

Designed for mobile plant asset management tasks, the Field Xpert™ handheld and associated Device Xpert software can be used to parameter and diagnose all registered HART® and FOUNDATION™ fieldbus devices. It can be connected point-to-point with an appropriate Bluetooth modem or an Ethernet Wifi network access point.

### SupplyCare

SupplyCare is a web-based information system for remote monitoring of tank and silo inventory at multiple site locations. Current measurement values of on-site assets can be accessed via fieldgates company-wide in the Intranet or worldwide via public telephone networks and the Internet. SupplyCare software for the collection and processing of data can either be installed on your premises or hosted by Endress+Hauser. Conventional web browsers allow information to be called up by authorized materials administration and logistics personnel – at any time and from any workplace. Secure access via the Internet can be provided for external partners and service providers. As an alternative or supplementary option, measured data can be integrated into existing systems at logistics, enterprise and management levels.



## Solutions

### Field Network Engineering

Endress+Hauser's experience and understanding of your fieldbus requirements allow us to apply the most appropriate technology in the most appropriate way, right from the start of a project. Our design processes ensure that the wealth of information available today from modern field devices can be used to reduce your operating costs and deliver new levels of process automation excellence. With our help you can be sure to choose the correct devices and components for the job, correctly dimension the fieldbus segments or wireless networks and ensure that the response times fit your application. We will help in the engineering, installation, integration and commissioning of the devices, and provide you with full documentation on project completion.

We test and integrate our fieldbus devices in all important systems encountered in the process industry, ensuring seamless integration in your application. In order to ensure a high level of competence for both our service engineers and your operation staff, we also provide hands-on, certified training in fieldbus and wireless networks.

### Plant Asset Management

Effective management of instrumentation is a key factor in the efficient running of a processing plant. By adopting a structured approach at all stages of the plant life-cycle it is possible to reduce both capital and operating expenditure. Additional advantages are higher plant availability, better product quality and increased yield. Endress+Hauser's Plant Asset Management tool set achieves this by:

- Shortening the start-up time of a plant regarding all activities around automation plant assets
- Optimizing plant availability by monitoring and predicting asset health and supporting efficient maintenance measures

In addition to FieldCare® and Field Xpert®, Endress+Hauser offers a number of other products and services around plant asset management. An analysis of your installed base will pinpoint potential weaknesses and provide a strategy for ensuring safer production. Our CompuCal software assists you in the scheduling, recording and archiving of calibration activities. Finally, web or enterprise access to W@M, our comprehensive instrument database, ensures that device information, spare parts, manuals, drivers and much more are accessible 24/7.

### Flow Management Solutions

Flow Management Solutions provide highly accurate flow metering for many gases and fluids. It is commonly applied for high value hydrocarbon liquids. State-of-the-art Coriolis systems measure mass, density, and viscosity of the fluid.

### Inventory Management

It is essential for modern industrial enterprises to offer their customers a first class service while minimizing their own business costs. In many cases, optimization potentials in the production process have already been exhausted, which is why management is increasingly focusing its attention on logistics processes. Endress+Hauser provides support here with information solutions and information services for the tank and silo logistics of process industries: inventory is taken of current bulk solid and liquid assets at all locations, thereby supporting central procurement and internal distribution over widely scattered sites. Inventory management of raw materials can be outsourced to suppliers. Added value services such as Vendor Managed Inventory can be operated for the customer. This has the effect of reducing procurement and internal costs, while securing and increasing turnover on the distribution side.

### Tank Farm Management

Today, productivity and increasing yields are fundamental demands from every business. Therefore, every single site needs to provide maximum storage space at the lowest costs with the highest safety standards. In addition, an increase of the worldwide consumption of oil products is recognized and leads to a higher turnover of media, on the one hand, but also to a higher need of buffering peaks and establish reserves, on the other hand.

The increased demand pushes prices up and the need for a more accurate way of assessing tank inventories is intensified. A lot of these highly valuable liquids - be it oils, refined products, alcohols or chemicals - are subject to Weights & Measures regulations with some special requirements. But usually not every stored product is governed by these rules and the question arises how the different requirements can be combined in one system.



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