talkline

Endress+Hauser
People for Process Automation

Index

Events — Come visit us

April 15–17	WEAO Technical Symposium and OPCEA Exhibition, London, ON
April 22–25	MPWWA 38th Annual Training Seminar, Charlottetown, PEI
April 25–26	ISA Automation Expo & Conference, Edmonton, AB
July 18–19	Rockwell Automation on the Move, Vancouver, BC

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Our valued friends, customers and business partners

Dear Reader,

Welcome to our first issue of *Talkline* for 2018. I am sure most of you are looking forward to the end of winter and to the ultimate arrival of spring. The winter of 2017 certainly delivered in terms of snowfall and cold temperatures. Now we can all look forward to some warmer days ahead.

Over the course of 2017, and continuing throughout 2018, we are making strides towards improvements in the speed and efficiency with which we serve you. We are committed to being the best company you've experienced doing business with. To that end, we are working diligently every day to ensure you see quality in every aspect of your interactions with us. Our goal remains to eliminate any inefficiency or waste that isn't adding value to you and your success. I encourage you to provide me feedback either way as to how we are doing !

In the pages ahead, we have a lot to share. Learn about our new flow product, Picomag—the flow meter that fits in the palm of your hand! Another example of an innovative E-direct product that can be ordered online. We also share our 2018 tradeshow and event schedule. We invite you to visit us either at an industry trade show or at one of our Partners in Process events co-hosted with Rockwell Automation. Come see what this partnership is all about and the benefits it offers our customers.

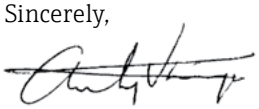
In addition, we share our 2018 webinar schedule. There's always a topic of relevance to consider taking online. But you can also learn offline and in person! We have our state-of-the-art Process Training Unit (PTU), and the various courses offered in 2018. Check out the schedule and see what training opportunities exist for you and your teams.

We are also proud to announce that our website (www.ca.endress.com), now boasts e-commerce functionality. Have a look at our homepage and the shopping cart icon available at the top right of the page. Online ordering has now been integrated directly into our website as we continue the journey towards continuously serving you better.

As we put the first quarter of 2018 behind us, please remember that there are many ways to engage with Endress+Hauser. For those of you who are "social savvy," connect with us on LinkedIn, Twitter, Facebook and Instagram. You can keep up-to-date with our work, our customer events and our various business developments over the course of the year.

On behalf of the entire Endress+Hauser team, I wish you all a successful 2018 and we hope you will look to us to help you be as efficient and competitive as possible.

Sincerely,



Anthony Varga
President and CEO

Endress+Hauser Celebrates its 65th Anniversary

In 2018, we look back on 65 years of success.

On February 1, 2018, Endress+Hauser celebrated its 65th anniversary. From its origins as a two-man operation created by Georg H Endress and Ludwig Hauser in 1953 in a small apartment in Germany, the company has grown into a corporate network spanning the world. Today, markets and customers see us as a leading global provider of process and laboratory measurement technology, automation solutions and services.

The history of Endress+Hauser is marked by continual change, a development that can be seen in the constant opening of new fields of activity and sales markets. Endress+Hauser has been a full-range provider of process measurement technology for many years now. We recently strengthened the area of process analysis and entered the market for laboratory analysis. Also, internationalization of our company began quite early. Today we can ensure competent sales and support in 125 countries and we manufacture in all the world's major economic regions.

Despite constant change, the structure and culture of our family company ensures a high degree of continuity. This framework allows us to develop the business for the long term and drive innovation forward. Along the way we are always guided by clear principles and a strong set of values. With the motto "first serve, then earn," our company founder left a legacy of unconditional customer focus, as well as a deep trust in people and their abilities.

Innovation In Instrumentation Also Comes From Basic Measurement Technolgy

Instrumentation in the field has reached a very high level of safety, accuracy and repeatability. What if innovation in the measurement of secondary and utility circuits could provide for significant added value to processes in all industries?

By Victor Outrebon, Endress+Hauser Canada Ltd

Historically, industrial process measurement and automation manufacturers have been constantly improving the performance of instruments to reach a better accuracy and repeatability or to ensure safer operations in the field.

In the meantime, demand has steadily grown for simple, reliable and maintenance-free measuring instruments with compact designs. Manufacturers had to adapt to new requirements from the process industry. Contrary to highly sensitive measurements where performance, accuracy and safety are critical, utilities and secondary circuits measurement would be very valuable too but are requiring rather simple, compact and cost-efficient devices. Over the last few years, instrumentation manufacturers have expanded their offering of user-friendly and basic functionality devices to adapt to that new demand.

Simplicity in the field

With ever-improving performance and functionalities, instruments in the field may also appear to require an increasing level of time and knowledge for their selection, their sizing and their commissioning. Staff training could also be an issue with continuously evolving software and device maintenance.

Simplicity of operation is therefore important for basic functionality sensors. These additional sensors in the field should almost be installed and run autonomously to keep the focus on the major production lines. Therefore, simplicity of installation and minimal maintenance are key for these types of cost-efficient instruments.

Where hazardous approvals are not required, fit-for-purpose sensors and switches are a good fit in every industry.

Integration of utility circuits in Industry 4.0

In the context of Industry 4.0, sensors and control systems are becoming the ears and the heartbeat of processes across all industries. Advancements of digital protocol in process automation are also allowing a smoother implementation of these basic measuring instruments in the field.

With most companies having set up energy reduction programs focusing on efficiency, major plant operations and utilities start to be monitored on the same level. Capturing and optimizing utility operations not only provides better system visibility but it also contributes to better productivity in the field overall.

Examples can be found in all industries, not only for utilities. Monitoring the flow of secondary circuits such as heating or cooling lines becomes truly beneficial in optimizing productivity in the field. In the primaries and metals industry, industrial furnaces can have a substantial amount of return lines where temperature and flow need to be monitored. Due to space restrictions and the cost of traditional instruments, compact flowmeters can now monitor these cooling lines and detect leakage at a reasonable cost.

In the food and beverage industry, cleaning and rinsing applications can be quite costly due to the amount of water they require. Monitoring process water or controlling water consumption in cooling processes can help in reducing the utilities bill and can positively impact the bottom line significantly.

Water, air, gas, energy and steam (WAGES) in the field can now be fully monitored. As processes are now moving towards Industry 4.0, their integration into a digitalized process environment should also be considered.

Digitalization for all instruments

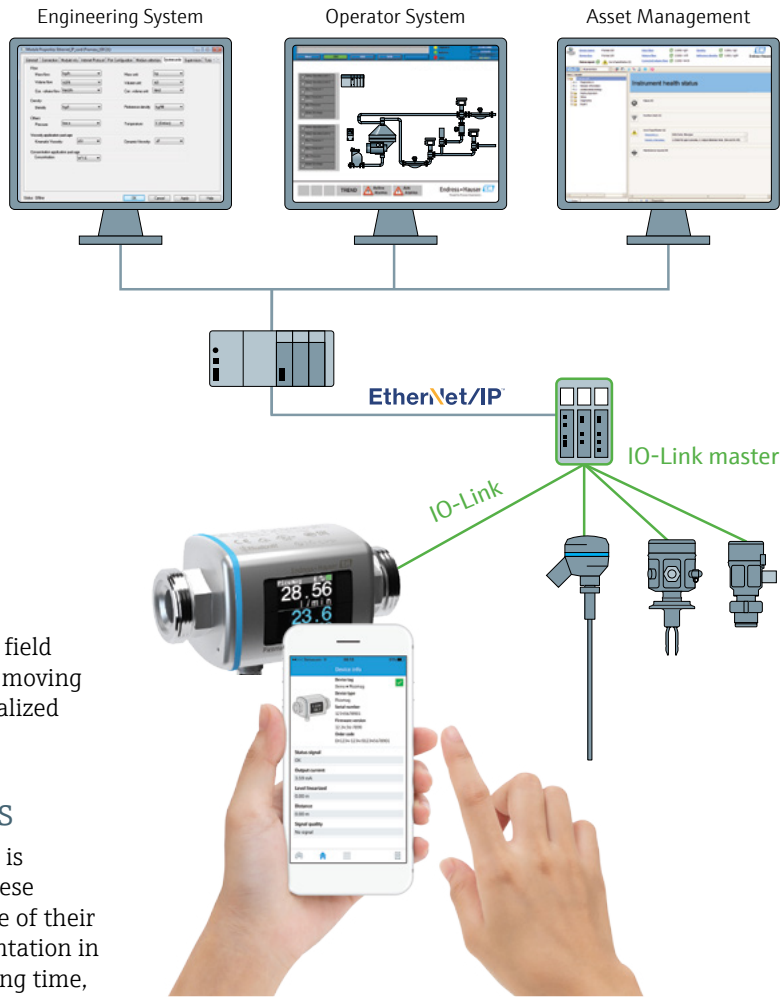
Seamless integration of basic functionality devices is necessary in a digital environment. Quite often, these entry-level instruments are not considered because of their lack of compatibility with the rest of the instrumentation in the field moving towards digital protocols. For a long time, instrumentation manufacturers refrained from implementing digital communication into their basic sensors, for cost optimization.

Developed by a consortium of industrial manufacturing companies, IO-Link is a digital protocol that offers huge improvements in the implementation of basic sensors in the field. Time and cost of project implementation can be reduced significantly thanks to this open protocol. It is a point-to-point technology that enables diagnostics and tracking capabilities from sensors and actuators. Each IO-Link device is connected to an IO-Link master, that acts as a getaway to a fieldbus such as Ethernet/IP.

Since IO-Link is not a fieldbus dependent system, it can be added to existing control systems at minimum cost.

Other advantages of the IO-Link technology include the automatic transfer of parameters after a device replacement as well as low wiring effort compared to conventional wiring.

In confined spaces where direct wired communication can be critical, some instruments even feature wireless communication capabilities such as Bluetooth. This allows



IO-Link is a standardized communication technology (IEC 61131-9) that shortens commissioning time and allows plug-play device exchange.

for commissioning devices as well as reading process values and accessing diagnostic information remotely. Manufacturers like Endress+Hauser have implemented Bluetooth capabilities into flow and level sensors, accessible via a smartphone app.

Plug-and-play flowmeters for utilities

Flowmeters represent a large share of instrument costs in the field across all industries. Due to their high accuracy and advanced functionalities, process automation professionals tend to install them on process critical lines only, mainly because of their high price point. Utility flows (monitoring of cooling lines or process water for instance) often don't get measured even though they can deliver significant information to field operation personnel.

Smart plug-and-play flowmeters that measure and monitor flow and temperature of conductive liquids can be cost-

Picomag is ideally equipped to handle the future requirements of process automation.

E-direct complements the traditional range of products from Endress+Hauser with easy to select, high quality instruments with low prices and prompt delivery. Visit www.e-direct.endress.com/ca.

efficient. In addition to their high-accuracy flow sensors, Endress+Hauser has developed a compact flow meter with intuitive operation thanks to a wide display, offering Bluetooth and IO-Link compatibility.

The Picomag combines a sensor and transmitter in the same housing, with a 1.4-inch TFT color display showing flow, totalizer and temperature readings, as well as warning and alarm messages. Outputs include 4-20mA, pulse, switch and 2-10V. The Bluetooth wireless interface allows direct access to process and diagnostics data, and enables the user to configure the measuring device on the fly. The device can be operated and configured on Android and iOS devices via the free SmartBlue App. It is possible to carry out wireless configuration or data retrieval over a distance of 10 meters—even at installation sites which are difficult to access.

Errors occurring during operations are displayed via diagnostic symbols in accordance with NAMUR recommendation NE 107 (same standardized message as per the high-end flow instruments available on the market). The screen rotates automatically depending on the installation position (horizontal, vertical), guaranteeing optimal readability at any time. Configuration parameters can be called up and monitored by simply knocking on the device.

Due to its compact design, Picomag can be installed flawlessly into any pipe up to 50 millimeters (2") in diameter, even in confined spaces. For this purpose, there are various process connection adapters available, such as NPT-thread, R-thread, internal thread, tri-clamp or Victaulic. Picomag is a cost-optimized solution for applications where the focus is on high repeatability (±0.2% o.f.s.) and thus reliable measured values—e.g. for correctly measuring water flows (max. 750 l/min, 198 gal/min) or for minimizing energy costs in utility applications. Picomag is suitable for process temperatures between -10 to +70 °C (14 to 158 °F) as well as for process pressures up to 16 bar (232 psi).

The robust Picomag housing made of stainless steel (IP65/67) is available in two designs. Left: DN 15 (½"), DN 20 (¾"), DN 25 (1"); right: DN 50 (2").

Focus on customer service

The instruments themselves are one thing, but customers are also expecting a seamless experience when purchasing these fit-for-purpose types of device. Having the ability to order online at any time and get fast delivery for these instruments is important since basic instruments don't require a vast amount of consultation before being purchased. To better serve these new demands from the process automation industry, manufacturers such as Endress+Hauser have adapted their model to offer an online platform (www.e-direct.endress.com) with pre-configurable instruments available in stock for faster delivery. For these entry price instruments, carts can be pre-populated and ordered easily online.

Developed according to the highest quality standards as with the most advanced instruments, these cost-efficient devices don't compromise on quality. With a whole new segment of basic functionality instruments, all industries can now access cost-efficient instruments to complement their advanced sensors in the field.

iTHERM TrustSens

World's first self-calibrating thermometer

iTHERM TrustSens performs cyclical self-calibrations during the active process. A milestone in temperature measurement.

How it works: Inline self-calibration with TrustSens

Regulated Industries Measuring devices in the Life Sciences and Food & Beverage industries often require pluri-annual calibrations. Removing and re-installing probes is a time-consuming and costly step, especially in large plants.

The DIY Attitude TrustSens is the world's first sensor capable of self-calibration, making process disruption a thing of the past. Fully traceable, cyclical and during the active process, reducing the risk of undetected non-conformities to a minimum.

Physical Principle The sensor makes use of the so-called Curie temperature: A physical constant at which certain materials abruptly change their magnetic properties. The Curie value can be accurately determined for each material.

Built-in Reference A special reference cross-checks the primary temperature sensor. Every time the process temperature drops below 118 °C (239 °F), the reference triggers the recalibration of the primary sensor.

Minimum Effort Manual intervention is only necessary when the TrustSens sensor reports a malfunction.

Certificate on demand Audit-proof calibration certificates can be issued at any time using an asset management software such as FieldCare by Endress+Hauser.

100% Compliance – 0% Effort

- Maximized process safety through self-calibration and Heartbeat Technology
- No production downtime due to fully automated and traceable inline self-calibration
- Fully automated documentation — audit-proof
- Highest measuring accuracy through characteristic adjustment (Sensor-Transmitter Matching)
- International certifications and approvals: EHEDG, ASME BPE, FDA, 3-A, 1935/2004, 2023/2006, 10/2011, CE, CRN, CSA General Purpose
- Measuring range: -40 to +160 °C (-40 to +320 °F)
- More than 50 sterile and hygienic process connections as standard

Industry applications

- Life Sciences
- Food & Beverage

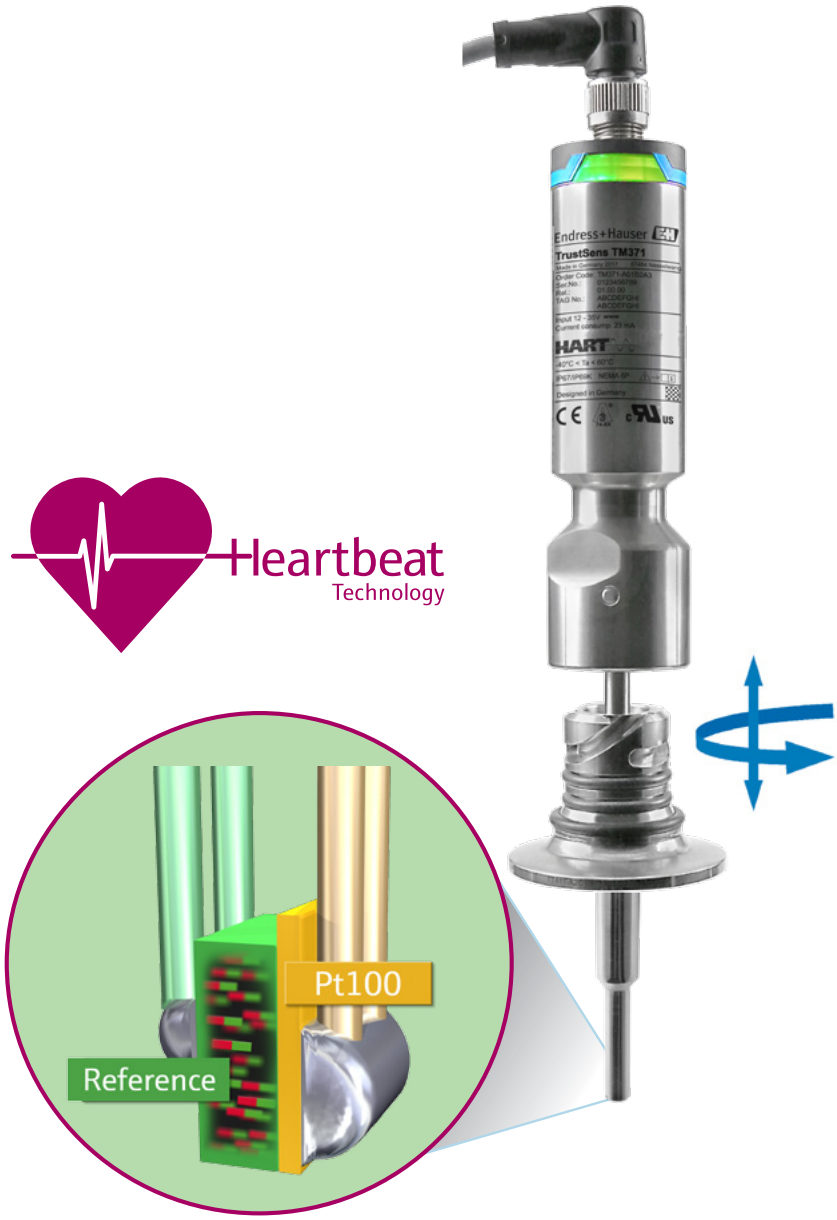
iTHERM QuickNeck

Removable neck tube with quick fastener:

- Tool-free removal of the thermometer
- IP69K protection

Documentation

- Built-in memory for 350 calibration points
- FieldCare by Endress+Hauser makes issuing calibration certificates possible at any time
- The automatically generated documentation is 100% audit-proof



Conventional calibration

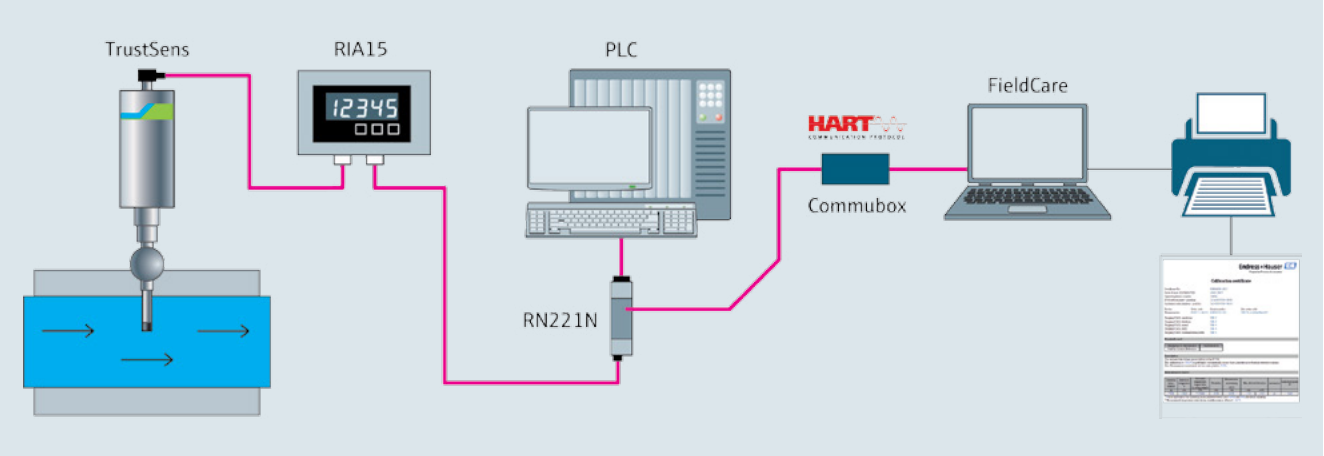
- Removal: A sensor requires recalibration yearly or even weekly, depending on the industry and the critical nature of the measuring point. The process must be interrupted for that purpose.
- Calibration: Qualified personnel must remove the sensor and perform a calibration in a mobile block calibrator with a traceable reference.
- Reinstallation: The production process may be restarted only after the probe has been reinstalled.
- Documentation: Government agencies and customers request valid verification documents. A specialist is required to manually issue certificates to be filed with the customer.

Self-calibration with TrustSens

- Self-check: TrustSens features a built-in reference sensor that cyclically monitors the primary Pt100 temperature sensor during the active process.
- Operation: The process is not interrupted. Maintenance personnel are only required when the sensor reports a malfunction.
- Reference measurement: The reference sensor uses the fixed Curie temperature point at 118 °C (239 °F) to trigger a self-calibration. This typically occurs for example during a steam cleaning cycle.

For more information please visit
www.endress.com/trustsens

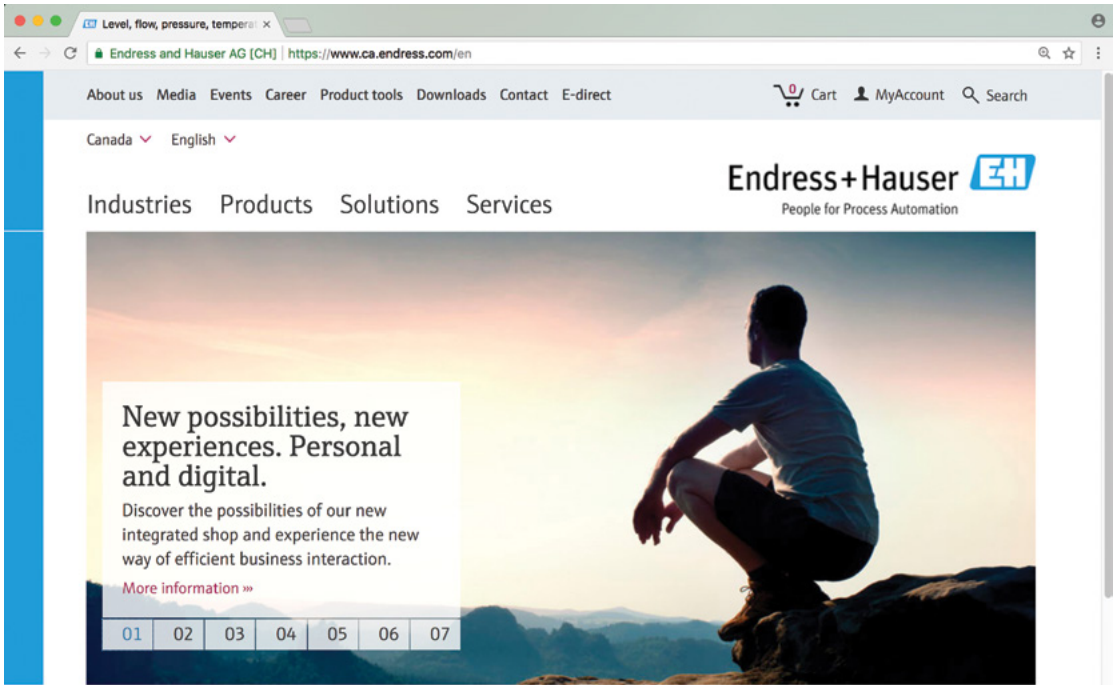
Integrated product and service offering



Data Management Memograph M RSG45	▪ Tamper-proof data storage and access (FDA 21 CFR 11) in combination with FDM Software MS20, Field Data Manager Software by Endress+Hauser ▪ HART® gateway functionality; Up to 40 HART® devices connected at a time ▪ Communication capabilities: Modbus, PROFIBUS DP, PROFINET, EtherNet/IP
Display unit RIA15	▪ Display of 4 to 20 mA measured values or HART® process variables ▪ The RIA15 can be used to display TrustSens values such as: temperature, electronic temperature, calibration counter, calibration offset ▪ Loop-powered; Voltage drop ≤1 V (HART® ≤1.9 V)
Field Data Manager Software MS20	▪ Automatic service for report generation, printing reports, read out of data, storing of data, secure export, pdf generation ▪ Create reports and templates ▪ Read out measured data via online interface or from mass storage ▪ Online visualization of instantaneous values (“live data”)
Commubox TXU10 Commubox FXA195	Quick and easy link between TrustSens and PC via USB interface for fast device configuration
	Instrinsically safe HART® communication with FieldCare via USB interface
Endress+Hauser Service	▪ Commissioning service ensures optimal startup and reliable base for future self-checks ▪ Technical experts are always on call to support with product queries

New Possibilities, New Experiences. Personal and Digital

Experience the new way of efficient business interaction



The integration of the Online Shop into the company website underlines Endress+Hauser's goal of providing support to customers to streamline their procurement processes and to improve their buying experience. Our online presence has undergone extensive revision. More than just a redesign, a great deal of focus was placed on maximizing functionality and usability to create a comprehensive information and procurement platform.

A comprehensive purchasing tool

Integration of the online shop into the website has made it easier for planners, purchasers, engineers and maintenance personnel—in short, everyone—to discover and easily purchase from our complete product portfolio. With the combination of product information and direct purchasing options, the procurement process is easier than ever.

Personalized information

Once logged in, a wide range of individual and detailed information is available including personalized pricing and order history. All transactions of a company or a company branch can be viewed in one summary, irrespective of whether these were completed online or offline. The range of services includes integrated document management. Users can access all documents such as quotes, invoices and delivery information to obtain a comprehensive overview. All customers can assign role-based access rights and strategic purchasers have a multiple log-in option at their disposal.

Sound good? Visit www.ca.endress.com now and try it for yourself. Look to the top right corner of our homepage and you'll see the Shopping Cart and My Account selections where you can register or login directly.

With the new functionalities you can now:

- buy products directly—right where you learn about them
- view all your business transactions with Endress+Hauser irrespective of whether these were completed online or offline
- access your personalized environment (agreed prices, standard products, contacts etc.)

Who Decides When You Should Calibrate Your Instrumentation?

When it comes to when and why your plant's instrumentation should be calibrated, making informed decisions based on your business needs should always be your number one focus.

By Steve Claffey, Service & Solutions Product Manager, Endress+Hauser Canada

Failure to calibrate instrumentation can negatively impact performance, while calibrating too frequently can result in excessive costs without providing any benefits to your business. So the question is, how do you determine if calibration is needed and what the frequency should be?

In many process plants, instrumentation is calibrated annually or more frequently simply because "that's the way it was done in the past." New instruments and technologies, combined with careful planning and investigation, can allow plants to calibrate instrumentation at an optimum frequency, resulting in substantial operational benefits and cost savings.

A piece of instrumentation which is not measuring properly can cause many problems. In a custody-transfer application involving crude oil or natural gas, even the smallest error can cost millions of dollars each year. In a food processing plant, a similar error would adversely affect the quality and safety of food products, resulting in the costs associated with such failures.

Because accurate measurements are critical to many processes, the industry standard is to calibrate annually, even though it might not be necessary. In many cases, this is executed in an attempt to demonstrate to an auditor instruments within the process are under control. For most companies, annual calibration is performed as a traditional ritual with no scientific basis, other than it being the longest duration of time they are willing to risk before finding a potential problem.

In many instances, yearly calibrations are not necessary, as some instruments require calibration only once every three or four years depending on the process application, operation, and criticality. In other cases, a device may require calibration much more frequently, possibly on a monthly basis, to maintain a safe, efficient, or regulatory compliant operation. It's also important to realize calibration intervals are not always fixed, meaning they may fluctuate based on usage or historical performance.

So, how do you determine when to calibrate a measuring device? By setting up a calibration plan which follows best practices for instrumentation calibration.

The Importance of a Criticality Assessment

The first step in a calibration plan is to perform a plant-wide assessment of all your instrumentation. To do this, you must first identify and generate a list of all the equipment parts and all instrument-related systems. This list should also include details such as description, location information (accessibility), operating conditions, working range and history, and any other points that provide a better understanding of the device's function.

The first stage in analyzing this data is to identify which instruments are critical to the application, the environment, and to operator safety. To start, the head of metrology (quality) and head of maintenance, or similar professionals who have the most in-depth knowledge of the process and related instruments, should together determine their knowledge of the process environment, the condition of the installed instruments, the type of maintenance work carried out and, finally, any limitations imposed by the plant in terms of servicing. After this information is compiled, it is important to start from the finished product and the tolerance permitted in relation to

its quality, and go back through the various stages in the production process. At each stage it is important to assess each instrument in place and ask, “Does this instrument have an impact on the quality of the product (or intermediary product) on process functioning, or operator safety?” The total installed base will determine how frequently to calibrate instrumentation. The next step is to then set up a calibration plan depending upon these factors.

The instrumentation manufacturer should also advise you on all of the factors to bear in mind when defining which measuring points to include and assess the plant’s installed base. They can also help define the right calibration plan based upon your frequency requirements.

Prioritize Your Instrumentation

After an assessing your instrumentation installed base, it is important to categorize all devices by critical importance. Your instrumentation should fall into one of four categories, ranging from critical to noncritical importance.

The first category, instruments critical for the product are those that directly affect product quality. We start here, because these devices have a direct link to company profits, whether it involves measurement of ingredients in food processing, mixing of chemicals, or custody-transfer applications.

The next category, devices critical to the process. This category are devices that can upset the overall plant or other processes (shutting down the entire process) and thus cause inefficiencies and production losses, but have no direct effect on product quality or safety. Instruments critical for safety have a direct impact on operator safety, equipment protection, and/or the environment. These

Four Categories of Critical Importance

Instruments should be classified according to one of the four categories of critical importance below.

1. **Instruments critical for the product:** that, if defective, may have a direct impact on product quality.
2. **Instruments critical for the process/system:** that, if defective, may have a direct impact on process or system performance, without affecting the quality of the final product, or safety.
3. **Instruments critical for safety/the environment:** that, if defective, may have a direct impact on operator safety, or the environment.
4. **Non-critical instruments:** that, if defective, are thought not to have any impact on product quality, process or system performance, safety, or the environment.

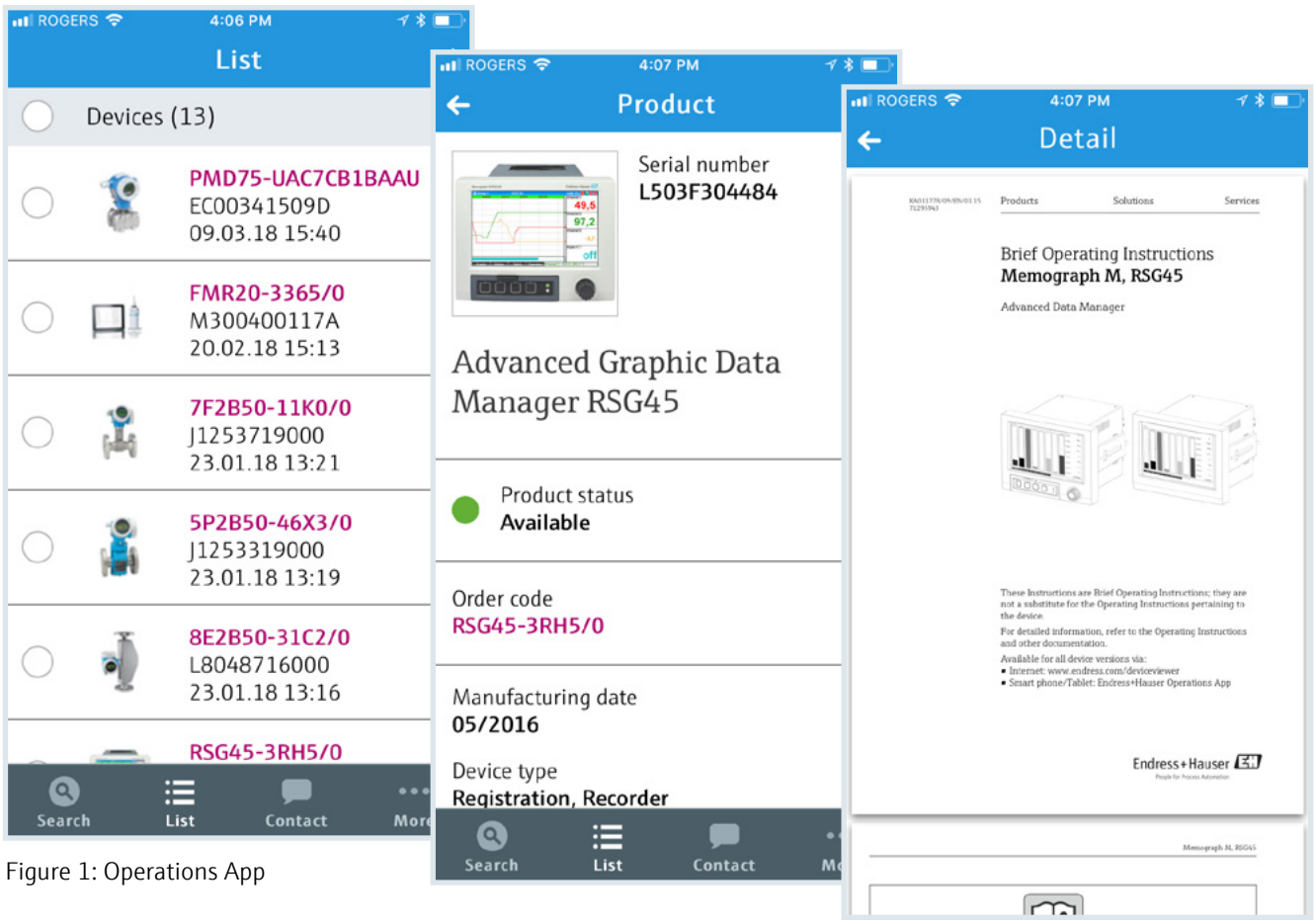


Figure 1: Operations App

devices do not necessarily have to be extremely accurate, but they certainly have to work properly and reliably.

Finally, non-critical instruments have no impact on product quality, the overall process, safety or the environment.

After all instrumentation has been identified and classified into these four categories, a Maximum Permissible Error (MPE) is assigned to each device. MPEs define the tolerance for each function being measured. A critical device will usually have a more stringent MPE than a non-critical device.

If you can show an auditor or other responsible entity that a non-critical device has no effect on product quality, safety, or the environment, and its MPE is higher, then you can claim there is little or no need for periodic calibration. Conversely, critical instrumentation may need to be calibrated more often than annually to maintain critical product quality, process operation, or safety.

Asset Management

Instrumentation data from the audit should be stored in a central location or an asset information management system in an ideal situation. An asset information system provides information such as spare parts lists, drawings specific to the specific instrument, and original calibration data and certificates. Instrumentation is often calibrated by each manufacturer prior to delivery to the customer, and the calibration data is easily entered into asset management system. Afterward, when the instrument is recalibrated, the device's calibration history is updated and can potentially be automatically loaded via an electronic calibrator connected to the asset management system. The information in an asset management system is then accessible by mobile devices used by maintenance personnel (Figure 1). From the field, a technician may call up the calibration history, diagnostic data, troubleshooting instructions and other information needed to properly diagnose an instrument problem.

With intelligent instrumentation onboard diagnostic data such as Heartbeat Technology from Endress+Hauser can be read by the automation system and/or by the asset management system. For example, diagnostic data for a Coriolis flowmeter includes empty pipe detection, sensor drift, sensor error, electronics error, inhomogeneous mixture error, ambient and process temperature errors, and other information. This data can be used to optimize calibration, to diagnose problems, and to detect minor issues before they grow into substantial problems.
An industrial PC equipped with asset information

management software such as W@M, condition monitoring, or HMI/SCADA software can access all the real-time data and diagnostic information it needs directly from the devices.

In many cases, modern instruments equipped with advanced diagnostics such as Heartbeat from Endress+Hauser can determine if a problem exists, and condition monitoring can inform the maintenance department via an alarm that a particular piece of instrumentation may be having problems.

Deciding When to Calibrate

Setting up an instrumentation calibration plan for individual instruments often requires assistance from the instrumentation manufacturer and a qualified calibration company with industry experience such as Endress+Hauser, as they are best qualified to advise on how often a device should be calibrated in a typical installation. The instrument owner must then use this advice and apply it based on particular service conditions, functions of the meter, and their experience.

Calibration frequency depends on the criticality of the device and MPE, as well as the nature of the product being measured, the continuity of the process (continuous use or intermittent use), the need for clean-in-place (CIP) operations, the severity of process impacts, the type of instrument (contact or non-contact), and how easy it is to access and remove the device for calibration. In some cases, it may only be possible to access a device during a complete process shutdown. In other cases, a device might be completely accessible for calibration.

In a new plant, setting the instrumentation calibration frequency is usually based on expected operational parameters and advice from the instrumentation manufacturer and qualified calibration team. However, in an existing plant, the frequency of calibration may be based on actual historical experience and previous documented calibration performance with the instrumentation and processes which yield great results. It's important to note in either case regulatory, or safety legislation should always take precedent on calibration intervals regardless of historical data from previous calibrations.

Once a calibration plan has been in effect for a few years, the asset information software takes on a larger role. When a calibration is carried out on a device, new data is recorded and stored in the data base. This data shows the status of the device before and after calibration, and it may very well indicate that the device does not require calibration as often as expected.

Thanks to advances in smart instrumentation, onboard diagnostics and asset information management software and portable calibration rigs setting up a calibration plan based on best practices is much easier than ever before.

Once set up, the calibration plan improves operations and saves money by making sure all instruments are calibrated only when necessary.

If you need help with your calibration needs, Endress+Hauser is happy to help as and when you need. Contact your local Endress+Hauser Technical Sales Specialist or:Endress+Hauser Service: 1 866 887 1666.

For more information please visit
www.endress.com/calibration

Calibration

Gain transparency and control of product quality and regulatory obligations while optimizing production costs

Are you facing a continuous increase of demands relating to process reliability, plant safety and product quality? With measurement precision being critical, calibration is also growing in importance.

A smooth and safe running plant is your top priority and compliant calibration is an integral part of its operation. Endress+Hauser supports every aspect of your calibration process in line with industry regulations. Receive only the best from our broad range of services, including a unique on-site flow calibration service. Let us take care of your calibration needs and take advantage of our calibration competences to optimize your processes.

Regular calibration is essential to keep the instrumentation controlling your quality-critical processes in spec. Endress+Hauser provides timely, traceable, and cost-effective services that are accompanied by clear and concise calibration certificates. From in-situ testing to fully accredited laboratory calibration, we carry out and advise on every aspect of calibration.

Cost-effective, reliable calibration as and when needed

Ensuring consistent quality and full compliance

Make full calibration compliance your ongoing goal. Benefit from full compliance and audit readiness with complete and traceable calibration performed according to ISO 17025.

Invest in calibration expertise for results you can rely on. Secure, accurate and consistent results for your devices over their entire life cycle by putting our metrology expertise to work for you.

Save time and minimize production losses. Keep all your processes working reliably and your devices in spec. Our on-site calibration services deliver precise, dependable and cost effective calibration.

Entrust your calibration to safe hands. Make safe procedures a priority to prevent harm to users, consumers and the environment. Compliant calibration ensures the safety of your processes and products.

Calibration close to operating conditions

On-site service increases process availability

On-site calibration is performed by highly trained engineers. Convenient and cost-effective, it removes the need to send instruments off-site as our specialists come to you, keeping downtime to an absolute minimum. It also offers the highest flexibility as calibration can be scheduled according to process shortages.

Our qualified and experienced field service engineers can perform adjustments, diagnose faults and recalibrate instantly where necessary. We calibrate all of your plant's installed base, not just Endress+Hauser devices. Having our engineers on your site also offers the benefit of direct communication with your staff and means that calibration takes place close to the operating conditions.

Unique on-site flow calibration Our mobile trailers with portable calibration equipment are stationed close to you, allowing your instruments to remain at your place of operation. Depending on plant topology, many measuring points can be quickly calibrated with minimal interruption to your process.

Mobile trailers perform a comparison between two devices under test. They are all fully traceable to national and international standards thus allowing end-to-end traceability of measured values.

Laboratory services to achieve highest accuracy

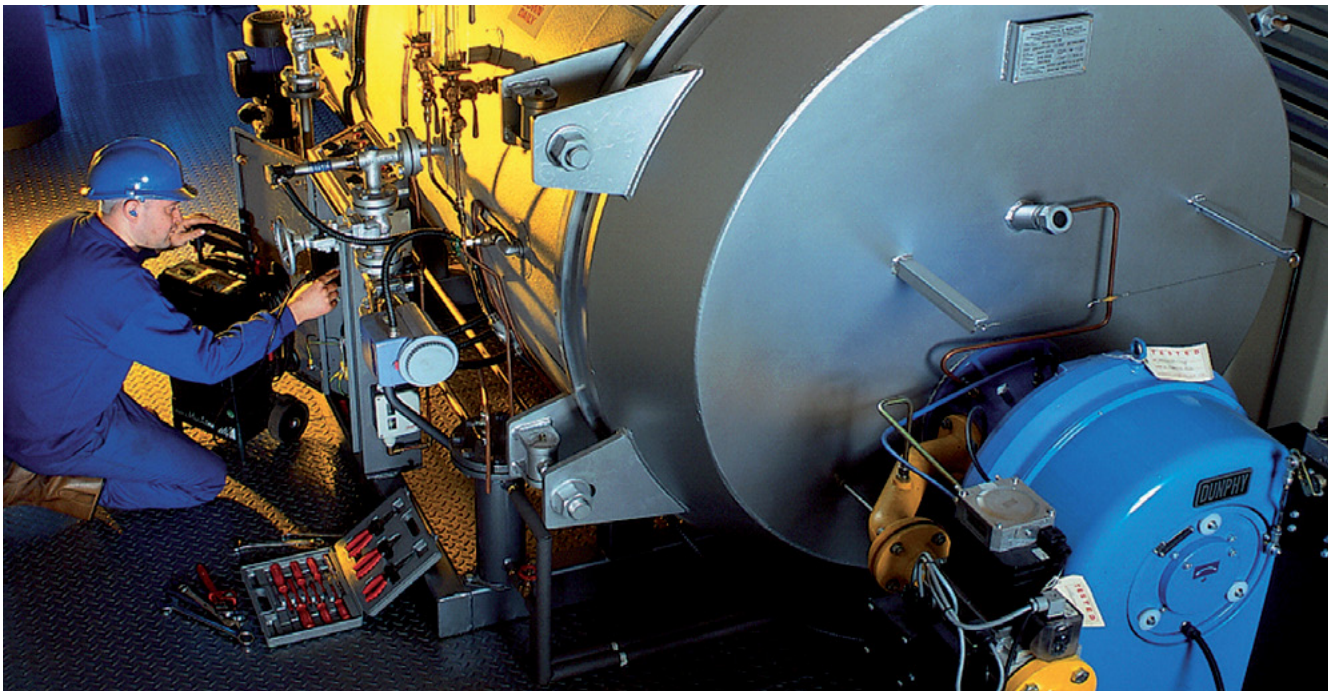
Worldwide high-tech calibration systems for standardized quality statements

Our calibration laboratories are located worldwide to provide the best possible service, wherever and whenever you need it. These identically built high-tech calibration systems ensure standardized quality statements. No other calibration provider can propose such a wide range of assistance worldwide.

For decades Endress+Hauser have been planning, building and constantly improving high-tech calibration rigs with dedicated specialists, engineers, software developers, technicians and designers. Regular contacts to national metrology institutes maintain the exchange of specialist know-how. This knowledge ensures our calibration rigs always represent the state-of-the-art metrology.

These benefits allow you to dependably measure and process costly raw materials and intermediate products, complying with stringent quality specifications, and implementing optimum process automation to minimize costs.

Our primary standards laboratory has the resources you need to meet the traceability of your lab standards. All our laboratories are environmentally controlled, ensuring the correct atmosphere for the precise measurements your instruments require.



Smart Scale Energy Solutions
Steam Systems

Monitoring the efficiency of steam boilers pays off

A typical steam boiler often consumes many times the initial capital expense in fuel usage annually. The annual fuel consumption can easily be five times higher than the initial investment cost for a boiler. Consequently, a difference of just a few percentage points in boiler efficiency will result in substantial fuel savings.

The Challenge Constant monitoring of a steam boiler and the steam system is the key to improving system performance and detecting changes at a early stage.

The Solution Endress+Hauser can help you to define the right KPIs which help you to evaluate:
1. Steam boiler efficiency,
2. System balancing and leakage,
3. Specific energy consumption.

This is the precondition for energy management and cost reduction. Our energy and data manager RSG45 collects, stores and displays all the required data.

1. Boiler Efficiency

The economic evaluation of steam boilers has to include the technical layout and features as well as the definition of the actual maintenance and fuel usage requirements. Of these criteria, the key factor to benefit from continuous cost reductions is monitoring the fuel usage or boiler efficiency.

Benefits

Monitoring and analyzing the steam system helps to:
- Benchmark steam boilers and optimize the steam consumption
- Gain transparency of the fuel consumption
- Identify the ideal operation load
- Identify, quantify and allocate losses in the steam system
- Verify investments in heat recovery measures

Boiler efficiency, in the simplest terms, represents the difference between energy input and output related to the steam process.

It accounts for the effectiveness of the heat exchanger as well as for the radiation, convection and blow down losses. Therefore it helps to:
- Gain transparency of the fuel and steam consumption,
- Identify, quantify and allocate losses in the system,
- Benchmark boilers, consumers and optimize their use,
- Minimize maintenance costs and downtimes,
- Verify investments in heat recovery measures,
- Evaluate most efficient operation load of boiler and production.

It starts with the determination of the actual performance for all existing boilers. This requires accurate and repeatable measurements of the steam output, the heat remaining in the feed water and the fuel supplied to the burner. Recognized standards are used for each single calorimetric calculation, the input/output method is recommended by boiler manufacturers.

Payback Calculation Example

Situation:
- Boiler 50 KPPH* (125 psig)
- Operation: 8,000 h/yr
- Steam production costs: $15/Klb.*
  (Cost varies with boiler design/efficiency and gas/chemical cost)

Sources of energy loss:
- 75 PPH* or 600 Klb./yr per steam trap
  (Typically 25% of steam traps are defective)
- Efficiency loss due to scaling of heat transfer surface:
  0.5% = 2,000 Klb./yr steam
  (0.5% of 50 KPPH × 8,000 h/yr)
  (Typically fouling decreases efficiency by up to 5%, optimized cleaning intervals can improve this)

Payback:
Overall costs of instruments for boiler efficiency calculation and balancing: $20,000

2,600 Klb. (600 Klb./yr + 2,000 Klb./yr) × $15/Klb.
= $39,000/yr or $3,250/mth

The payback is approximately 6 months!

*KPPH = 1,000 pounds per hour
PPH = pounds per hour
Klb. = 1,000 pounds

Beyond the standard, Endress+Hauser multiparameter instruments provide more process information and therefore added value. Density or viscosity for liquid fuels, methane for biogas and pH/oxygen/total dissolved solids (TDS) for feed water.

2. Steam Balance and Leakage

Apart from the efficiency of steam generation it is important to make sure that the steam energy is used where it should be. A lot of energy is lost in steam systems due to improper insulation or leakage found at valve stems, unions, pressure regulators, equipment connection flanges, pipe joints and defective steam traps. Mass balancing by measurement at different points in the steam system helps to:
- Detect leakages in time (not at the end of year or month).
- Define ideal maintenance intervals and justify expenses.
- Find weak points in insulation.
- Quantify and reduce condensate losses and thus save valuable energy, reduce make up water and chemicals.

3. Specific Energy Consumption

The allocation of energy usage to specific areas and processes is one of the key factors for energy management systems (e.g. ISO 50001) and a precondition for transparent book-keeping. The exact measurement of steam consumption per unit of product (SEC) is also important to optimize production processes. Furthermore the data are suitable for a carbon footprint evaluation.

RSG45 Analysis

The energy and data manager RSG45 collects, stores and displays all the required data necessary for the monitoring of a steam system. By using the intuitive Field Data Manager software (FDM) it can be accessed from the desk and processed into a user friendly and meaningful format.

All relevant information is available in the RSG45:
- Boiler efficiency
- Fuel and steam consumption
- Leakage loss
- Specific energy consumption

Memograph M RSG45
Graphic Data Manager

Real World Hands-on Training
Courses offered at our PTU® (Process Training Unit)

Our process instrumentation schools are designed to teach fundamental, theoretical and practical knowledge about instrumentation and application technology — with an emphasis on service and maintenance of instrumentation. Each course contains a balanced mix of lecture, discussion and opportunities to take a hands-on approach to learning.

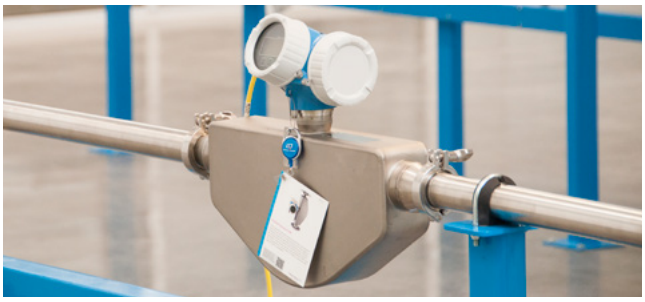
Hands-on learning is facilitated by working instruments as demonstration units on the bench, in actual working conditions installed in a PTU or in portable training stands designed to simulate actual operating conditions. All instructors are seasoned professionals with years of real-world experience in measurement.

Coriolis Flow Fundamentals FC103

A fundamental Coriolis flow course to understand proper installation and setup of the flow meter, and acquire basic troubleshooting skills.

The introduction to this Coriolis flow course provides maintenance and engineering personnel with a fundamental understanding of the Coriolis principle, with a focus on concepts required to properly install and commission Coriolis mass flow meters. Training includes how to properly troubleshoot and diagnose, test and repair typical errors that may arise with Coriolis meters.

This class consists of classroom and hands-on training performed with a combination of table-top and live devices installed on our Process Training Unit (PTU) — a full-scale, working process skid with online instrumentation and controls designed to simulate operating conditions.



Duration
This course is a two-day (16 hours) course at our Process Training Unit located in Edmonton, AB

Prerequisites
Basic computer and instrumentation knowledge

Objectives

At the conclusion of the course, attendees should be able to:
- Explain the basic concepts of how a Coriolis flowmeter operates
- Understand what information is needed to properly configure the device
- Install and commission Coriolis flow meters
- Troubleshoot errors with Coriolis meters, determine the source of the issue and repair the device when needed

Content

The course specifically covers:
- Coriolis technology basics
- Coriolis flow meter overview
- Proper installation and process influences on the measurement
- Gathering data needed for commissioning
- Sizing and verifying meter suitability for application
- Field tooling
- Meter commissioning
- Meter verification
- Possible sources of errors and troubleshooting
- Spare part identification and device repair

Who Should Attend

Operations and maintenance personnel responsible for the installation, commissioning or maintenance of Coriolis flowmeters.

Scan this QR to register online

Stay current with the right training for you

Electromagnetic Flow Fundamentals FC104
Two-day (16 hours)
Course outline online

Vortex Flow Fundamentals FC105
Two-day (16 hours)
Course outline online

Ultrasonic Flow Fundamentals FC106
Two-day (16 hours)
Course outline online

Time of Flight Level Fundamentals LC103
One-day (8 hours)
Course outline online

Certified Profibus Training CC201
Three-day (24 hours)
Course outline online

Certified FOUNDATION Fieldbus Training CC202
Three-day (24 hours)
Course outline online

Industrial Ethernet Training CC203
Two-day (16 hours)
Course outline online

Certified EtherNET/IP Training CC204
Two-day (16 hours)
Course outline online

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- With a wide range of topics, you're sure to find a subject to suit!

April
Tuesday
3

The benefits of replacing older technology with new

Traditional mechanical flow and level transmitters have been superseded by modern transmitters with no moving parts for the majority of applications. If you're thinking about upgrading your plant, we'll show you how we can save you time and money!

April
Tuesday
24

Drinking water safety

How can drinking water safety be ensured? A quick look at the most common disinfection methods used today, an introduction to the different applications (e.g. water distribution, seawater disinfection, etc.) and a look at our product portfolio.

May
Tuesday
15

Rugged instrumentation for your cement plant

The cement industry needs rugged and reliable instrumentation for most sections of the plant. Our process experts will share simple device selection criteria to ensure your device will last longer in your abrasive application.

June
Tuesday
5

3 ways to improve your crude oil distillation and fractional column processes

Distillation is one of the oil refining industry's core processes. In this webinar, you will learn how you can improve your mass balance with modern flow meters. We will also address more advanced technologies to make your refinery process more efficient and safe.

June
Tuesday
26

Extract more from less with reliable instrumentation

Process experts will share how to select best-fit products, services and solutions that reduce costs and maximize energy efficiency. Our measurement and control solutions ensure you meet water and air emission regulations.

July
Tuesday
17

Inline quality monitoring with photometers

Reduce the risk of product loss with a faster response to process changes, increase plant availability with less hold time for lab analysis, and secure an audit trail of quality parameters.

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E direct
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Picomag

Reliable and easy
- Simultaneous measurement of flow and temperature
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- Commissioning and operation via Bluetooth and SmartBlue App

$627.00
11–35 pcs.

IO-Link

Picomag	Price/pcs. in CAD		
Device model	1 to 3	4 to 10	11 to 35
Picomag DN 15(½"): 0.4 to 25 l/min	713.00	663.00	627.00
Picomag DN 20 (¾"): 0.75 to 50 l/min	819.00	762.00	721.00
Picomag DN 25 (1"): 1.2 to 100 l/min	956.00	889.00	841.00
Picomag DN 50 (2"): 5 to 750 l/min	1,214.00	1,129.00	1,069.00

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