talkline

Endress+Hauser

People for Process Automation

Index

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Our valued friends, customers and business partners

Dear Reader,

The second quarter of the year has already passed us by. Time for us all to prioritize some well-deserved downtime with family and friends, as we enjoy our wonderful Canadian summer. To those of you taking vacation time between now and the end of Q3, I wish you all a safe, relaxing and memorable summer.

As we started 2018 with an ongoing commitment to making improvements in how we serve you, we are now well into this journey … and we want to be 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. The goal at Endress+Hauser Canada remains to eliminate any inefficiency or waste that isn't adding value to you and your success. As always, I encourage you to provide me with feedback on how we are doing. Whether your feedback is positive or not, we want your input, so we can become the business partner you brag about!

In this issue of *Talkline*, we share an extensive White Paper co-written between Endress+Hauser and one of our customers and business partners, Encana Services Company Ltd. Discover how we took on a significant challenge and by working together, implemented a successful solution. You can also check out our 2018 trade show and event schedule. Where possible, plan to visit us either at an industry trade show or at one of our Partners in Process events co-hosted with Rockwell Automation. Learn first-hand what this partnership is all about and the benefits it offers our customers.

Seeking to improve your knowledge? You can always educate yourself via offline or in-person training! We have a state-of-the-art Process Training Unit (PTU), and various courses offered in 2018. Check out the schedule and see what training opportunities exist for you and your teams.

I also want to remind you that www.ca.endress.com, now boasts complete e-commerce functionality. Visit our homepage and the shopping cart icon available at the top right of the page. Online ordering has now been integrated into our website—part of the ongoing journey towards continuously serving you better.

Please remember that there are many ways to engage with Endress+Hauser. For those of you who are active in Social Media, connect with us on LinkedIn, Twitter, Facebook and Instagram. 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 safe and enjoyable summer and I hope you will call on us to help you be as efficient and competitive as possible.

Sincerely,

Anthony Varga
President and CEO

Steam Whistle brewery in the heart of Toronto

Today, Endress+Hauser measuring instruments are used to brew beer in a former steam locomotive repair facility — known as the Roundhouse — in a site located within walking distance of the CN Tower in Toronto.

Today Steam Whistle beer is brewed in the old industrial building

The Steam Whistle story begins in the Spring of 1998 with three friends on a canoe trip through Ontario's lakeland. Greg Taylor, Cam Heaps and Greg Cromwell had been colleagues at one of Canada's premier microbreweries in the late 1980s and '90s, before it was bought out by a national brewer and closed down, like so many of Ontario's independent breweries unfortunately. As they sat around the campfire, the self-named "Three Fired Guys" dreamed of running their own brewery one day—one that would make a Pilsner to compete with the best in the world.

Over the past two decades, Steam Whistle has grown into one of Canada's largest and most beloved independent breweries. The endeavor paid off because today the brewery produces the best Pilsner in Canada — with the help of Endress+Hauser measuring devices. For example, the pressure on the boilers is checked and monitored with the Cerabar S, the level with the Liquiphant FTL33 and Deltapilot M, and the flow rate with the Promag H 100. The brewery has been an all-round satisfied customer for some years now — with plans (made only recently), to open a new facility in Etobicoke, west of Toronto. Endress+Hauser was awarded the contract for the measuring technology during the tendering stage.

The brewery is located among high-rise buildings and within walking distance of the CN Tower

What sets the Steam Whistle brewery apart:

- The Pilsner beer is brewed in accordance with the Bavarian Purity Act of 1516
- No other brewery in Canada adheres to the strict standards of this Act
- Located in the heart of Toronto among high-rise buildings and modern architecture
- A former steam locomotive repair facility now serves as a brewery
- The venue can be booked for tours, events or wedding parties
- Another facility is due to open soon in Etobicoke, west of Toronto

The logo and name were inspired by steam whistles

The kegs are stacked meters high due to lack of space

View into the Roundhouse and bar area

Steam Whistle Pilsner is brewed at the historic Roundhouse in the heart of Toronto within walking distance of the famous CN Tower. The Roundhouse once served as the Canadian Pacific Rail company's steam locomotive repair facility, powering the trains that helped pioneer this nation. Fans of old trains can view a number of steam locomotives and passenger trains on permanent display in front of the building. Today the Roundhouse is opening up a completely new chapter in Canada's history as home to the Steam Whistle brewery. When naming the brewery, the three founders were inspired by the whistling noises of escaping steam that would signal the end of a long working day.

Steam Whistle is one of the only remaining Pilsners in the world (outside of Germany) that still adheres to the strict standards of the Bavarian Purity Act of 1516. It is brewed using only pure spring water, malted barley, hops and yeast without any artificial preservatives. There's no law in Canada requiring beer companies to list their ingredients on the label. In an age when larger, industrial breweries have abandoned tradition in favor of shortcuts, chemicals and fillers, Steam Whistle stands apart as an independent brewery that's committed to brewing Pilsner the way it has been made for centuries. The process involves boiling part of the mash at higher temperatures to caramelize the barley sugars and deliver a rich, malty flavor and a creamier head on the poured beer.

Awards

- 2017 Ontarios Choice Award
- 2017 Best Managed Companies
- 2017 Best Beer Outside BC
- 2016 Great Big Taste Award
- 2016 Ontario Tourism Award Of Excellence
- 2016 Ontario Brewing Award
- 2016 Food in Canada, Leadership Award
- 2016 Trip Advisors Certificate Of Excellence
- 2016 The Georgia Straight Award
- 2015 Bike Friendly Business
- 2015 Best Craft Brewery of Hamilton
- 2015 Best Of Vancouver
- 2015 Best Managed Companies

Joel clearly enjoys opening bottles for visitors to the brewery so that they are filled with more than just interesting facts

Train enthusiasts can visit old steam locomotives and passenger trains on permanent display in front of the brewery

Endress+Hauser measuring instruments are a major factor in the brewery's success

A few of the Endress+Hauser measuring devices in use at the brewery:

- Cerabar S PMC71
- Deltabar S FMD78
- Deltapilot M FMB50
- Promag H 100
- Batch Controller RA33
- Liquiphant FTL33
- Field Indicator RIA16

Visitors to the Roundhouse can view the brewing process and bar and enjoy a free beer. Guests first sample the finished Steam Whistle Pilsner but can also try the unfiltered version following the tour. Its prominent location and unique atmosphere mean that this brewery is an absolute magnet for visitors from Canada and all over the world. An unexpected historic, repurposed building in the heart of downtown Toronto surrounded by high-rises and modern architecture makes the Steam Whistle brewery an enriching experience.

The Challenge and Solution

Inventory Management of NGLs in 1.3 m x 500 m Horizontal Vessels

By Gord Bill (Encana Services Company Ltd.) and Jason Riegert (Endress+Hauser Canada)
Presented at The Canadian School of Hydrocarbon Measurement Calgary, 2018

Abstract

Storage and reconciling inventory of Natural Gas Liquids (NGLs) present different challenges depending on where this is done in the value chain. This paper is about a central storage facility where NGLs are piped in from several gas plants (single owner), trucked in liquids from diverse owners as well as liquids piped in from a third party. This centralized storage and truck terminal then supplies the market feeding into existing midstream infrastructure. While there are traditional metering points of custody transfer at each receiving and the final delivery point it's important to have visibility on the stored inventory and with that a balancing challenge to ensure the fluids on hand reconcile with all the receipts and deliveries.

Did we mention that the storage capacity we are referring to is approximately 3,500 m^3? Factor in the fact that the NGL is a high-vapour pressure liquid where a change in temperature of 10°C can result in an expansion/shrinkage of ±3% or more. By not having corrected volumes in the tubes there is a risk that the daily and monthly balancing could cause over or under reporting of the inventory.

As we alluded to in the title of this paper, the challenge is the inventory management of a storage system using multiple 1.30 m (diameter) x 500 m (length) horizontal vessels, essentially a tube storage system buried below the frost line. The challenges get a little more complex as the horizontal vessels are on a 1° slope resulting in one end of the vessel being essentially 5 m above the other end.

Please read on to understand how in collaboration an energy company as the operator, faced with a challenging problem and the solution provider challenged with delivering the solution came together with a successful project.

The Facility Schematic

As the Cutbank Ridge assets, a collection of new construction natural gas liquids (NGL) projects, come online and approach name plate the requirement to collect and store the produced NGLs meant that the Veresen Midstream Tower Centralized Liquids Storage (TCLS) facility project would start construction. An Inventory Management System would be one of the assets requirements in order to manage and reconcile the inventory and to satisfy the Measurement Accounting requirements imposed by the Regulator and contracts with the different stakeholders. Figure 1 is a simplified measurement schematic for the TCLS facility showing the multiple inventory inputs and single output and why storage and reconciliation would be critical for the project's operation.

The accounting procedure approved by the British Columbia Oil and Gas Commission (OGC) and the British Columbia Ministry of Finance (MOF) required Veresen Midstream to equalize:

1. The pipeline LACT sales volumes at a component level plus/minus tube inventory to,
2. The CLS receipt meters, both flow-lined and trucked production and to,
3. The gas plant meters plus/minus the NGL inventory at the gas plants.

Due to potential metering differences the equalization would be made through the application of proration factors.

Process Measurement

As dictated by the accounting requirements, all of the measurement systems were required to comply with the OGC Measurement Guidelines for Upstream Operations and the liquid metering systems need to have an installed total volumetric measurement uncertainty of 0.5%.

Since the NGL meter volumes at the gas plant's outlets, CLS inlet and pipeline LACT are being pressure and temperature compensated to API 11.2.2 and GPA TP-27, it is also important to perform the same compensation on the volumes inside the tubes because of the large volume. Altogether, the CLS has a combined capacity of 3,550 m^3 and since the NGL is high vapour pressure liquid a change in temperature of 10°C can result in an expansion/shrinkage of ±3% or more. By not having corrected volumes of the inventory there would be a risk to the daily and monthly balancing that could cause over or under reporting of the inventory.

The equipment required to accomplish this were:

- Level transmitters
- Temperature transmitters
- Pressure transmitters
- Density measurement transmitters
- Tank capacity (strapping) tables
- Tank volume corrector

Since temperature changes pose a huge influential factor on the inventory the key in the project design was to minimize the impact of temperature. One could imagine

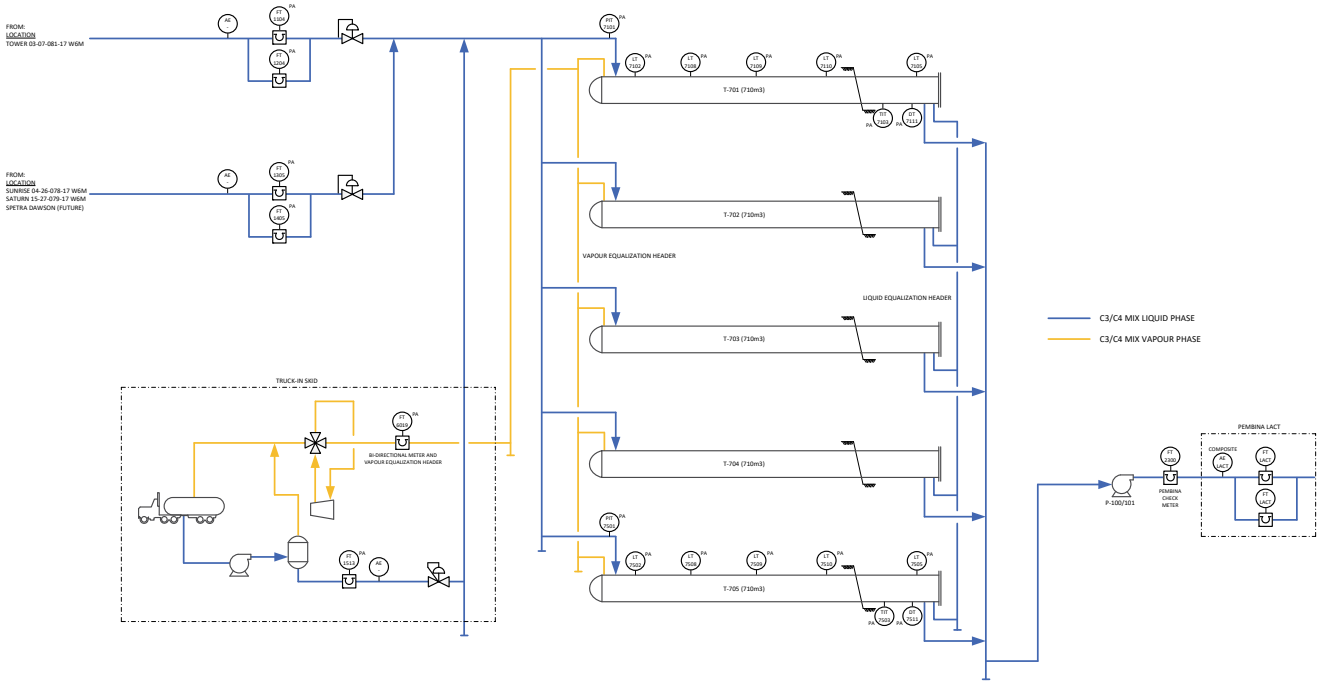


Figure 1- Tower Central Liquids Storage Schematic (simplified)

that 3,550 m^3 of high vapour pressure liquids would mean a significant tank farm of bullet tanks that would be exposed to the varying temperatures in North Eastern British Columbia, where the CLS is located in Canada. This is precisely why the best solution was to store the fluids below the frost line in five (5) five hundred meter (500 m) long tubes with a diameter of 1,300 mm each. The influence of temperature is thereby significantly minimized without the need for costly temperature controlled bullet tanks.

Other design factors that influenced the decision to use buried tubes where:

- Estimated lower cost of ~25–40%
- Lower construction/material costs
- Beneficial topography and lease space
- Regulatory viability — design accepted by the OGC
- Influence and experience from joint venture partners
- Simpler inlet/outlet header design
- Allowed for increased NPSH on sales pumps, reducing their size

Now you can understand some of the of reasoning behind storing the NGLs in a so-called Tube Storage facility.

To add to the inventory measurement, challenge the design required that the storage tubes be installed on a 1° slope. In theory measuring the level in a tube that is horizontally level would be fairly simple. The 1° slope and the length of the storage tubes (500 m) meant that the inlet would be 5 m higher in elevation than the outlet of the storage tube (see Figure 2), here in lies the challenge. Suffice it to say this paper further identifies the challenges of measuring inventory is these non-conventional storage vessels.

Simplified Volume Assessment

The process of evaluating the storage vessel(s) Net Standard Volume for the purpose of accounting and reconciliation of the facilities inventory meant that we need to determine the vessels liquid level and temperature in combination with a tank capacity (strapping) table which produces the Total Observed Volume. While factoring in various other calculations and volume correction factors as defined by the American Petroleum Institute (API) and as required by the OGC we are able to determine the inventory. The Tankvision Inventory Management System provides this function for the CLS. Figure 3 is a simplified flow chart describing a volume assessment similar to that utilized at the CLS.

Slope Challenges

So how exactly would the level measurement be performed in a 500 m long storage tube on a 1° slope? By utilizing five (5) guided wave radar transmitters equally spaced 125 m apart we were able to cover the necessary range of level measurement. Figure 4 shows how the five (5) Levelflex transmitters were installed in order to solved the challenge of measuring the level.

Tube Strapping

As detailed in Figure 3 in order to determine the inventory a tank capacity table (aka strapping table) is required. Determining the tank capacity table in a conventional tank commonly utilizes a surveying laser setup in the vessel. The challenge these storage tubes presented due to the 1° slope was that for each tube five (5) tank capacity tables (TCT) are required each TCT referenced for each of the five (5)

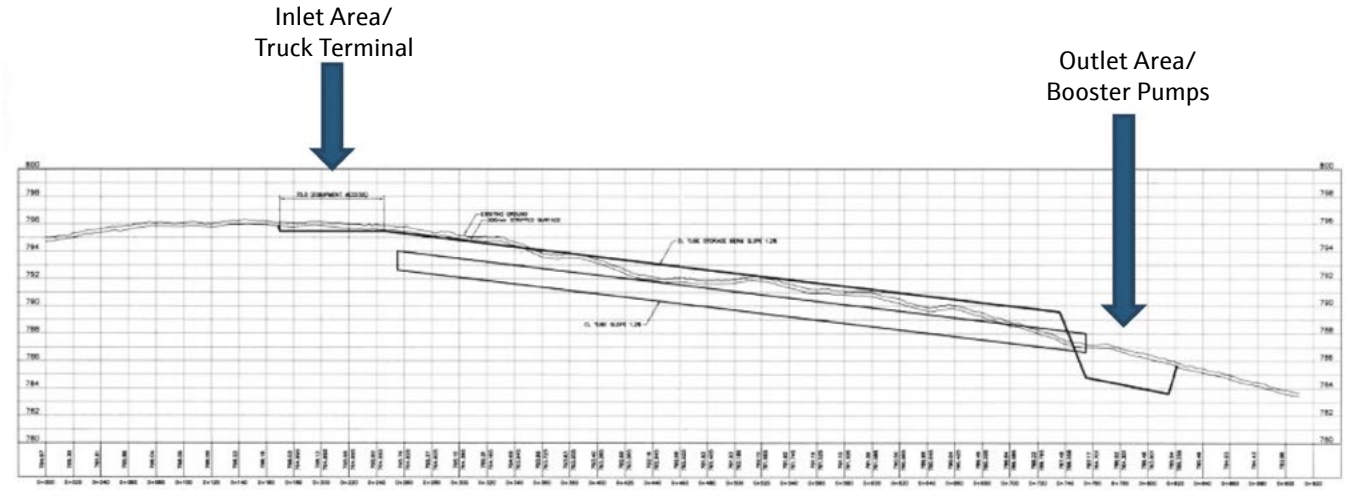
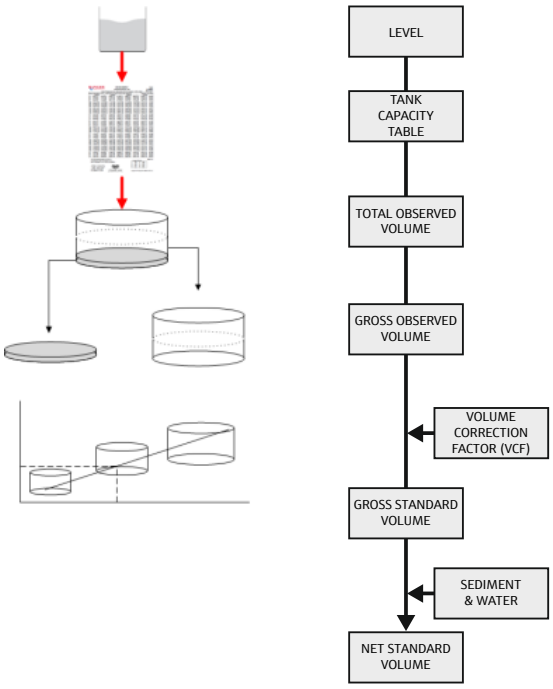


Figure 2 - Topography and Design Profile



Total Observed Volume (TOV)

- Temperature corrected for tank thermal expansion due to product and ambient temperature
- Compensates for the volume of the mechanicals in the vessel

Gross Observed Volume (GOV)

- Subtract the free water from the TOV

Gross Standard Volume (GSV)

- API table is applied. GSV = GOV x VCF (volume correction factor)

Net Standard Volume (NSV)

- Bottom sediment and water (BS&W) determined in the lab from samples is subtracted
- NSV = GSV – BS&W x GSV

Figure 3- Simplified explanation of Volume Assessment for an Inventory Management System

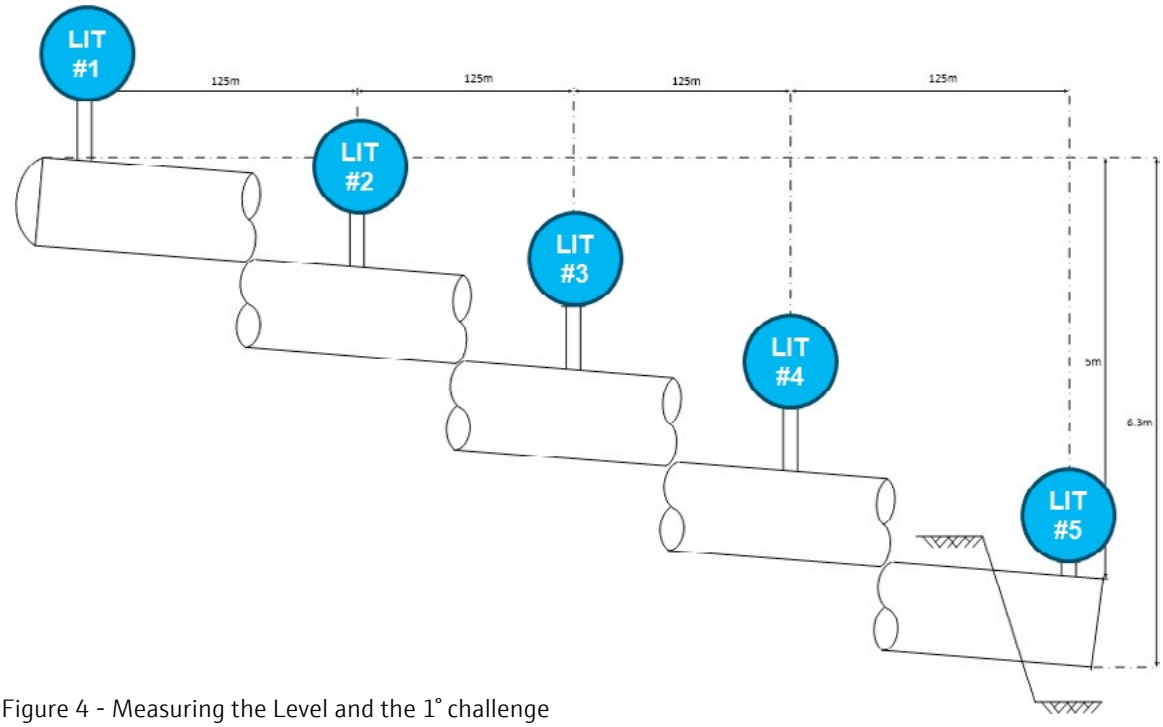


Figure 4 - Measuring the Level and the 1° challenge

level transmitters (LIT) as shown in Figure 4. We solved this challenge leveraging one of the required construction steps, the hydrotest. During the hydrotest a spare Coriolis was used to measure the corrected volume of hydrotest fluid as the tubes were being filled. Onsite Endress+Hauser technicians, utilizing a data acquisition system called Memograph, monitored the in-flowing volumetric flow and the level measurement of each of the five (5) Levelflex transmitters. Determining the tank capacity tables this way ensured that the level at each on the level transmitters versus volume would be known. This approach had minimal impact on the construction plan as we utilized an already planned step in the project — the hydrotest — in order to get determine the volume. One phase of construction yielded two results, hydrotest and tank capacity tables, the resulting TCT is shown in Figure 5.

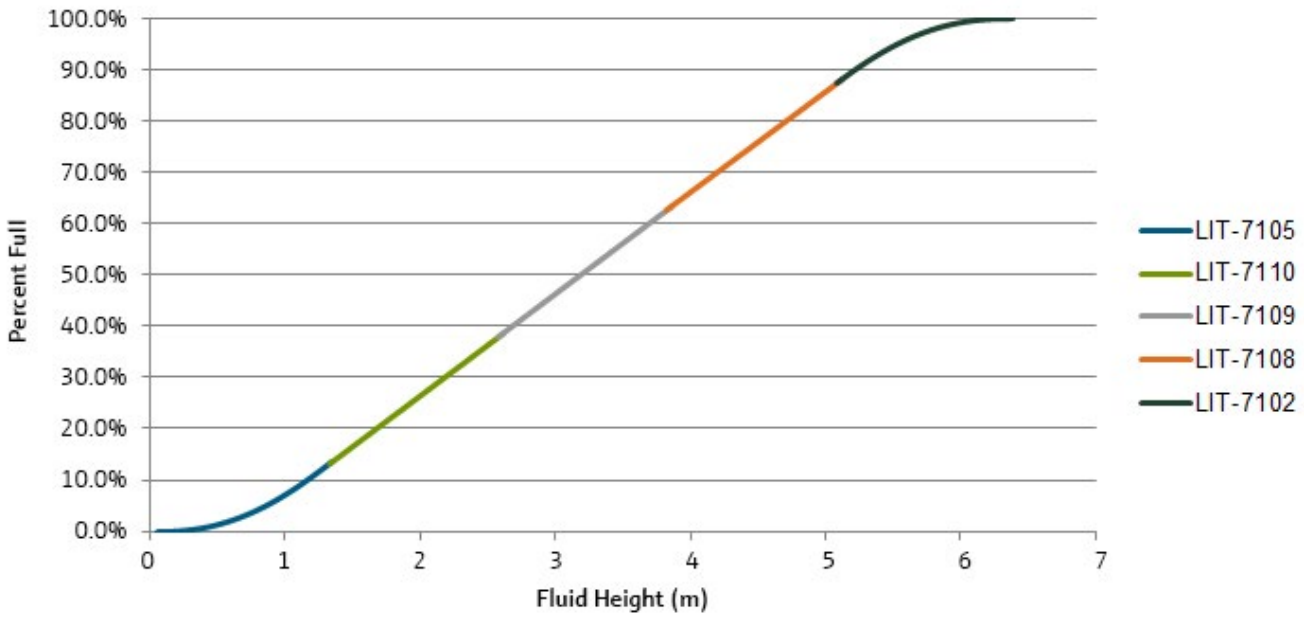


Figure 5 - Tank Capacity Table accounting for the 1° slope of the storage tube

Solution Selected

The desired operational philosophy coupled with the complexity of distance (500 m) meant that the project would utilize a Rockwell Automation ControlLogix Control System at the inlet terminal and at the outlet terminal interconnected over fiber optics as shown in Figure 6. To minimize wiring costs some of the instrumentation would be wired to each of the two control systems (inlet and outlet). In order to minimize rounding and resolution errors commonly expected with analogue 4…20mA technology, the project's mandate was to utilize a digital technology, HART protocol. This means that all of the instruments would output utilizing HART protocol which is interpreted by the control systems smart input modules. By utilizing HART, all measurements and calculations leverage 32 bit all digital values and this helps to satisfy the project requirement for an installed total volumetric measurement uncertainty of 0.5%. In order to maximize availability and minimize life cycle operating costs Veresen Midstream preferred an inventory management system that would directly determine the Net Standard Volume and output to the Terminal Control System without the need for special software installed on application servers. Here enters the inventory management system, Tankvision.

Tankvision interfaced to the ControlLogix to collect the different measurements all digitally leveraging the local area network based on EtherNet/IP. Tankvision then performs the required calculations satisfying OGC and MOF requirements by correcting the C3/C4+ volume to equilibrium vapour pressure and 15°C using GPA TP-27/ API MPMS 11.2 Table 54E. The results are then returned to the control system and operations over EtherNet/IP. To be specific the inventory system leveraged all digital and open interfaces minimizing the integration effort by not requiring custom interfaces that would prove to be a challenge to maintain over the operating life cycle.

One of the life cycle and maintenance requirements was the ability to verify and document the level instruments performance instu without the need to take the instrumentation offline or without interrupting the inventory measurement. Heartbeat Technology integrated into the guided wave radar transmitters selected offering instu verification traceable to the level instrument's original multi-point factory calibration. The distinct documented test can be initiated from the level device display or remotely with FieldCare software tunneling through the ControlLogix system providing technicians a

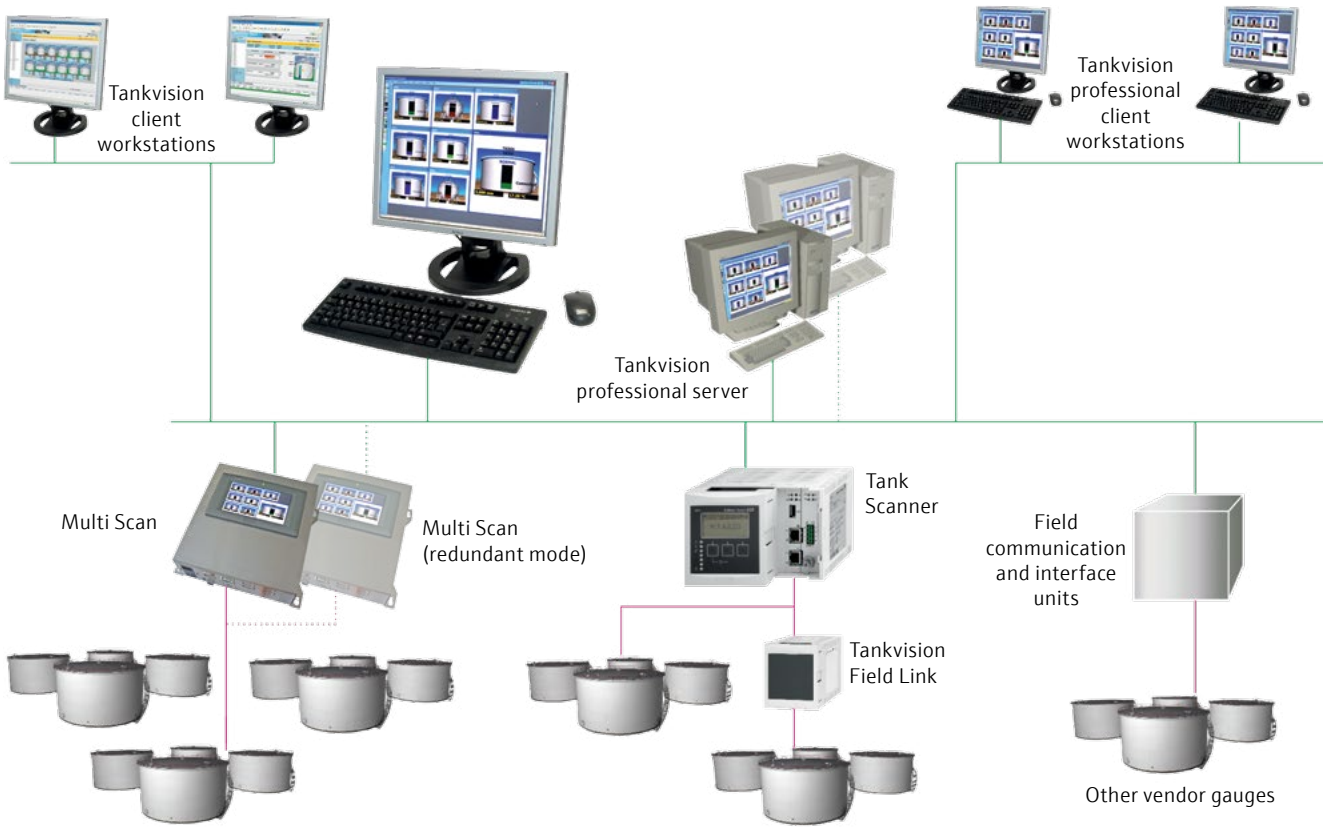


Figure 6 - Inventory System integrates with the ControlLogix PLCs without custom interfaces

simple guided test procedure, and automatically generated test protocol, providing proof that by means of supporting documentation, that the device measurement can be counted on. The tube design furthermore allows for the different level transmitters to overlap another providing further confidence by comparing one device to another as the tube inventory changes.

Our paper demonstrates how a challenging inventory measurement requirement can be solved through collaboration throughout the various phases (eg. design, construction, commissioning and operation) of an NGL storage facility.

References

- Memograph is a product of Endress+Hauser
- Levelflex is a product of Endress+Hauser
- Liquiphant is a product of Endress+Hauser
- Tankvision is a product of Endress+Hauser
- FieldCare is a product of Endress+Hauser
- Heartbeat Technology™ is a trademarked technology of Endress+Hauser
- ControlLogix™ product name trademarked by Rockwell Automation (www.rockwellautomation.com)
- HART® Registered trademark of the FieldComm Group, Austin, Texas, USA (www.fieldcommgroup.org)
- EtherNet/IP™ is a trademark of the ODVA, Inc. (www.odva.org)
- API, API MPMS (Manual of Petroleum Measurement Standards) are owned by the American Petroleum Institute (www.api.org)
- BC OGC is the British Columbia Oil and Gas Commission (www.bcogc.ca)
- MOF is the Ministry of Finance of British Columbia (www2.gov.bc.ca/gov/content/governments/organizational-structure/ministries-organizations/ministries/finance)

Endress+Hauser receives the German Innovation Award

Flow measurement technology impresses the jury twice

Endress+Hauser is the recipient of the German Innovation Award for two innovations. The company received the Gold Award for the Promass Q and also impressed the jury with the Proline 300/500 device family, which was recognized with the Winner Award in the connectivity category.

This year was the first time that the German Innovation Award recognized products that set themselves apart from currently available solutions through their added value. "With the innovative Promass Q flowmeter, Endress+Hauser has set a new standard for the precision measurement of quantity, density and temperature of a flowing fluid. After all, precise measurements increase product quality, reduce the reject rate and cut costs," said Andrej Kupetz, head of the German Design Council and chairman of the German Innovation Award jury. The competition resulted in a second award for the measurement technology specialist, with the Proline 300/500 family of instruments, which was recognized with the Winner Award in the connectivity category.

Promass Q – the specialist for demanding applications

The Promass Q, which offers superior measurement accuracy even in harsh environments, is designed especially for the oil and & gas as well as the food & beverage industries. With this flowmeter, Endress+Hauser guarantees unrivalled accuracy when measuring mass flow, volume flow and density, even in operating environments and process conditions that fluctuate heavily. Endress+Hauser has also developed a new function that enables the Promass Q to precisely measure fluids with entrained gases.

Proline 300/500 – innovative connectivity for IIoT solutions

Equipped with numerous functions and features, the new Proline 300/500 instruments can perform universal flow measurements in all applications of the process industry. These instruments measure the flow in pipes with superior accuracy while providing operators with a wealth of important diagnostic and process data. Thanks to optimized connectivity, intelligent self-monitoring with Heartbeat Technology and a cloud-based app, users can exactly identify the maintenance requirements of assents optimize maintenance planning and minimize plant shut-downs.

German Innovation Award

The German Innovation Award is divided into two classes of competition – Excellence in Business to Consumer and Excellence in Business to Business – plus the overall category of Design Thinking. The jury selects a Gold Award for top performance within an industry or particular field in each of the two classes of competition, in addition several innovations are recognized with the winner award.

The awards criteria include the degree of innovation, user benefits and cost-effectiveness. The jury comprises independent interdisciplinary experts from industry, science, institutes and the finance industry.

SAP and Endress+Hauser work on joint IIoT solutions

Open platform concept for process industry enables seamless integration of field instruments into business processes

SAP and Endress+Hauser will intensify their cooperation in the development of Industrial Internet of Things (IIoT) applications for the process industry. The enterprise software market leader and the specialist for process and laboratory measurement technology made the announcement during ACHEMA in Frankfurt, Germany, the world's leading trade fair for the process industry. In future, both companies intend to work closer together in the development of joint solutions, sales and customer implementation.

The goal is to fully integrate the Endress+Hauser field instruments as digital twins into the SAP cloud platform. Both companies want to take advantage of the services and smart apps from SAP's Leonardo system as well as Endress+Hauser's IIoT offering. The idea is to tightly integrate master and sensor data, as well as measurement values, into customer business, logistics and production processes and develop new digital services focused on predictive maintenance and predictive quality. An open platform concept forms the basis for this approach.

"Two innovative companies have come together here to realize the end-to-end OT/IT integration from field instrument all the way to business processes," said Hala Zeine, SAP's President of Digital Supply Chain and Manufacturing. "When it comes to digitalization, successful companies will be those able to tie their systems directly to business processes, thus reliably and fully opening up or circumventing the classic automation pyramid," explained Matthias Altendorf, CEO of the Endress+Hauser Group. "We and SAP share a common vision of implementing this strategy to the benefit of our customers."

Endress+Hauser's role in the partnership involves delivering the field instrumentation knowledge so critical to plant operators in the form of digital services, which will be implemented by integrating the existing Endress+Hauser IIoT services and the SAP platform using a standardized approach. From the initial creation and automatic updating of a digital twin across the entire product life cycle, to end-to-end connectivity from the sensor to the SAP IT platform, Endress+Hauser is supporting the digitalization strategy of its entire customer base.

SAP demonstrates the concrete benefits of the SAP Leonardo system as an innovation platform. In the SAP Asset Intelligence Network, field instruments are represented as digital twins, which serve as a basis for integration into the customer's business processes. Using SAP Leonardo technologies like Machine Learning, Analytics and Blockchain, intelligent services can be flexibly enabled for the production environment. Innovations in the area of maintenance and optimization will help customers achieve the two primary goals of reducing operational costs and increasing productivity.

About SAP

As market leader in enterprise application software, SAP (NYSE: SAP) helps companies of all sizes and industries run better. From back office to boardroom, warehouse to storefront, desktop to mobile device — SAP empowers people and organizations to work together more efficiently and use business insight more effectively to stay ahead of the competition. For more information, visit www.sap.com.

iTHERM TrustSens

World's first self-calibrating thermometer

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 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.

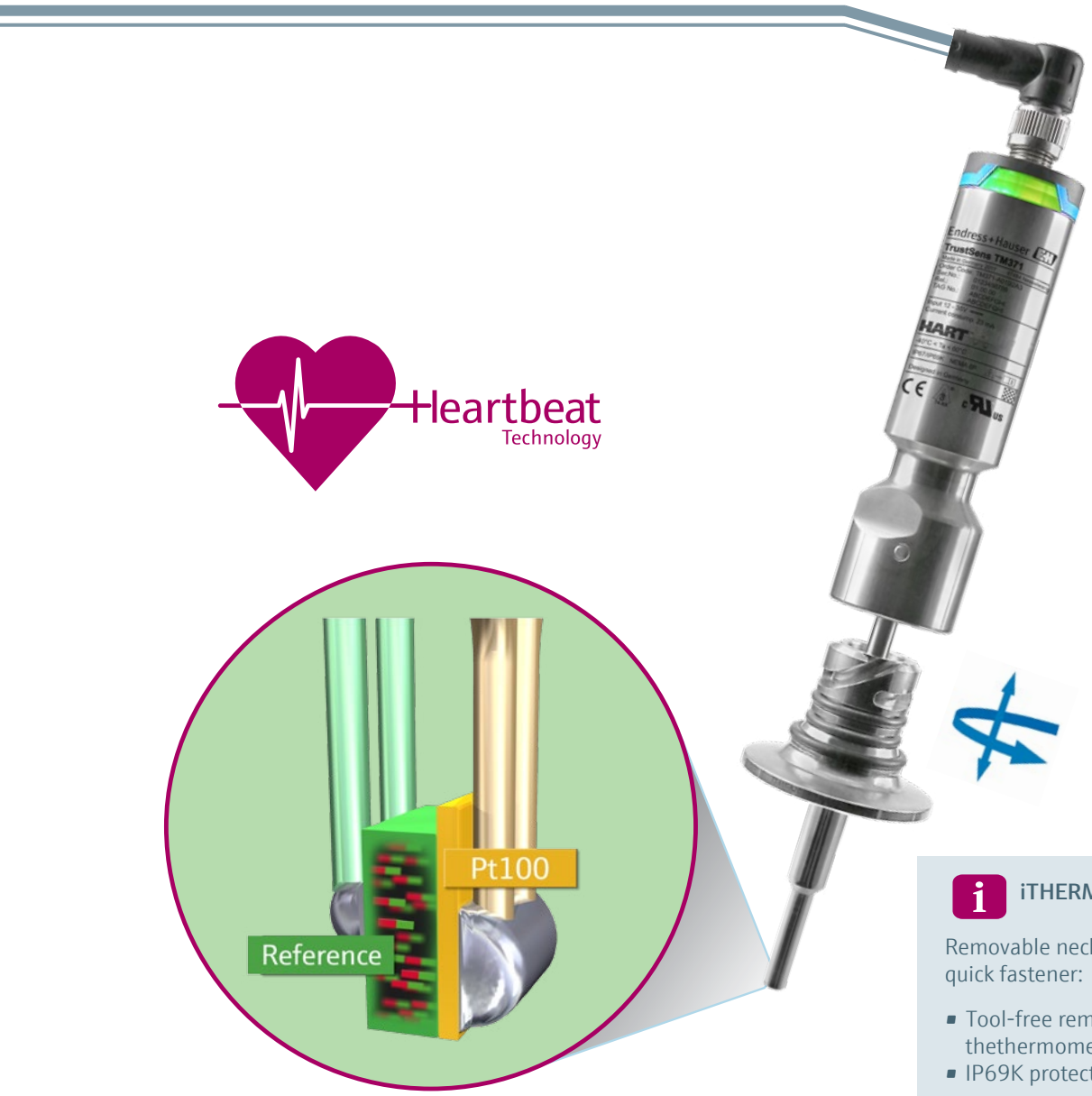
Built-in Reference A special reference cross-checks the primary temperature sensor. Every time the process temperature drops below 118°C (239°F), the reference triggers the recalibration of the primary sensor.

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.

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.



iTHERM QuickNeck

Removable neck tube with quick fastener:

- Tool-free removal of thethermometer
- IP69K protection

Self-calibration with TrustSens

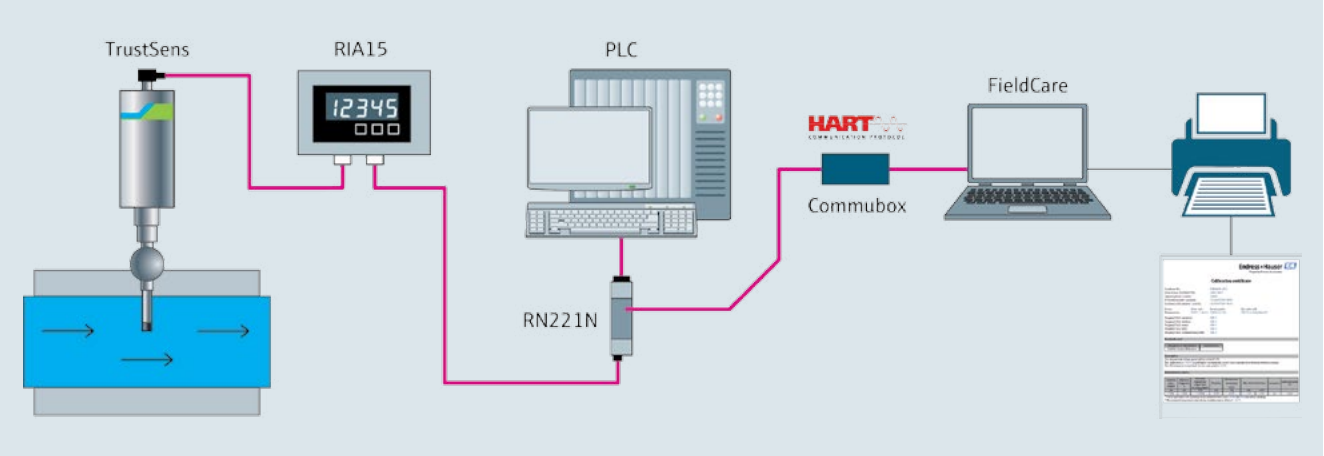
- **Self-check**: TrustSens features a built-in reference sensor that cyclically monitors the primary Pt100 temperature sensor during the active process.
- **Operation**: The process is not interrupted. Maintenance personnel is only required when the sensor reports a malfunction.
- **Reference measurement**: 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

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

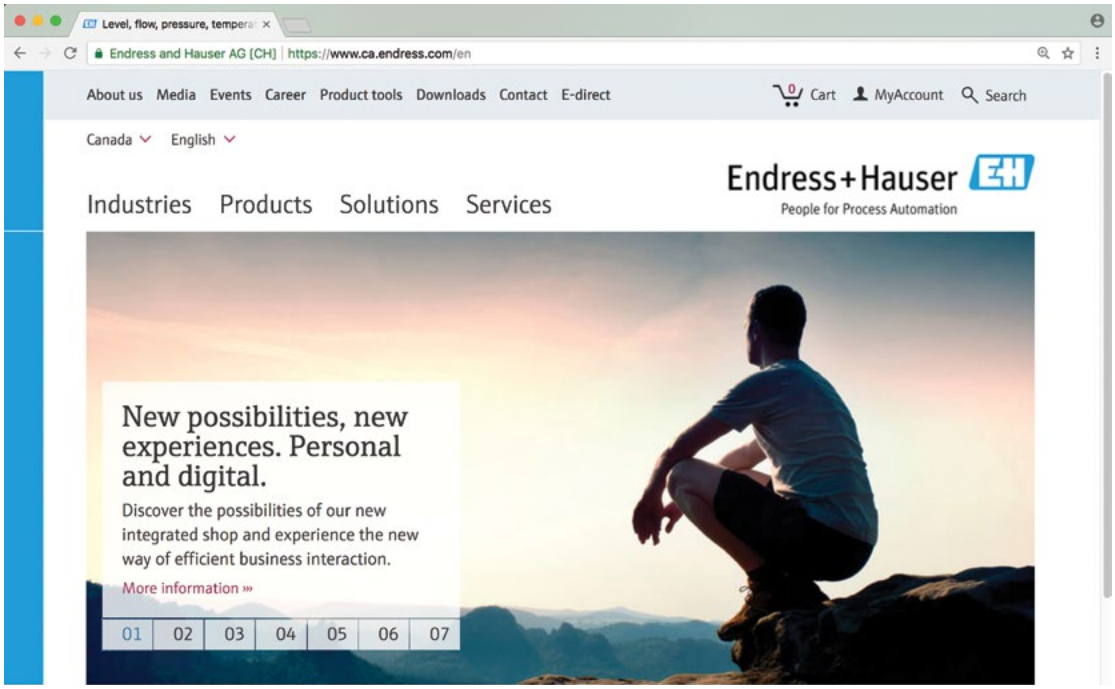
Integrated product and service offering



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.)

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.

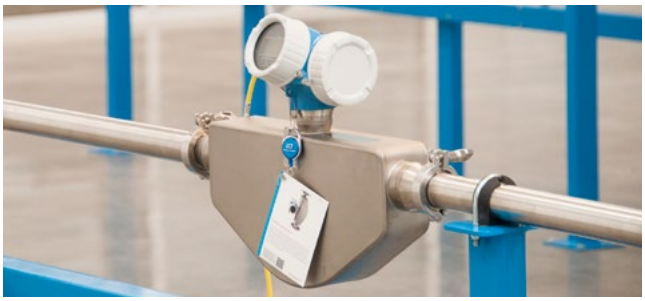
Hands-on learning is facilitated by working instruments as demonstration units on the bench, in actual working conditions installed in a PTU or in portable training stands designed to simulate actual operating conditions. All instructors are seasoned professionals with years of real-world experience 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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Our free webinars are your chance to find out more and chat directly with our experts!

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

July
Tuesday
3

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.

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.

August
Tuesday
7

Water management 4.0

Three simple parts of your IoT for Water Management solutions: Dashboards which efficiently show you the right information to manage your Water/Waste Water plants; an analytics platform which transforms data to meaningful information; and easy-to-deploy networking solutions to collect data from sensors in remote locations.

August
Tuesday
28

Product offering in Waste Water

Three key parameters to optimize the aeration process: dissolved oxygen, ammonium, nitrate and our product portfolio.

September
Tuesday
18

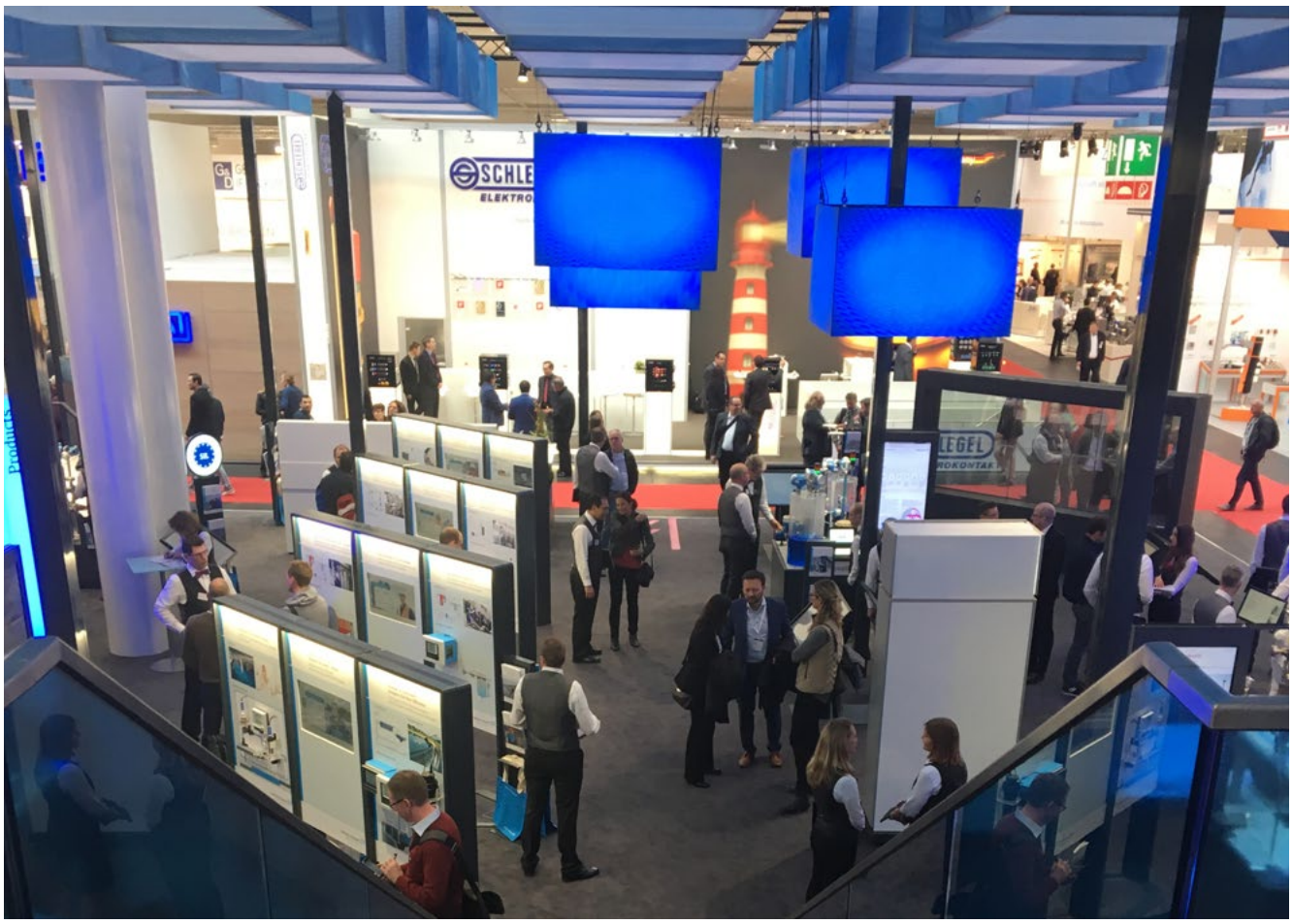
IIoT 2 - Update on what has happened since the last Webcast

As the world of IIoT is developing extremely quickly, we would like to update you on the latest status of our IIoT offering. In this webinar, we will demonstrate the latest products and developments, the newest features and give an outlook on what you can expect next.

www.endress.com/webinars2018

Trade Shows and Events – Come visit us

July 11	Customer Appreciation Lunch	Craft Beer Market, Calgary, AB
July 18–19	RAOTM	Vancouver Convention Centre, Vancouver, BC
August 24	Husky Autumn Leaves	Lloydminster Golf & Curling Club, Lloydminster, SK
September 11	Ontario W/WW Partners in Process	TBC, ON
September 13	Quebec W/WW Partners in Process	TBC, QC
September 18	CPECN Process Show	Nepean Sportsplex, Nepean, ON
September 20–21	CPECN Process Show	Sandman Hotel, Longueuil, QC
September 25	Tech Day with Benchmark	TBC, Sarnia, ON
September 25	Alberta W/WW Partners in Process	PTU, Edmonton, AB
September 27	Alberta F&B Partners in Process	TBC, Lethbridge, AB
October 16	Ontario W/WW Tech Day	Courtyard & Towne Place Suites, Markham, ON
October 17	CPECN Process Show	Ramada Plaza Calgary Hotel, Calgary, AB
October 18	Ontario W/WW Tech Day	TBC, London, ON
October 23	CsHm Grande Prairie	Entrec Centre Evergreen Park, Grande Prairie, AB
October 25	NWOWWC	Victoria Inn Hotel & Convention Centre, Thunderbay, ON
November 7	CPECN Process Show	Saskatchewan Delta Regina, Regina, SK



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