

# talkline

## 7 Refinery Application

Improve reliability and decrease alarms

## 12 Tank Gauging

State-of-the-art solutions and level instrumentation

5 Frost & Sullivan Best Practices Award

## Company of the Year

FROST & SULLIVAN

2016

BEST  
PRACTICES  
AWARD

GLOBAL WATER ANALYSIS INSTRUMENTATION  
COMPANY OF THE YEAR AWARD

Endress+Hauser 

People for Process Automation

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2016 Global Water Analysis Instrumentation Company of the Year Award.



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October 25–26	Eastern Ontario Water & Wastewater Conference, Ambassador Hotel, Kingston, ON
November 8	North Saskatchewan Process & Automation Show, Saskatoon, SK
November 9–10	Symposium sur la gestion de l'eau 2016, Laval, QC

### Connect with us

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# Our valued friends, customers and business partners

*Dear Reader,*

Welcome to the third issue of *Talkline* for 2016! I think I speak for most of us when I say that our summer has been wonderful, although it always comes and goes far too quickly! Here we are heading into the final quarter of the year and anticipating a change of seasons. Nonetheless, I sincerely hope you have all managed to enjoy some quality down time.

In this issue, we remind you to check out E-direct. This online ordering platform allows you to purchase simple instrumentation quickly, at extremely competitive prices, and have it shipped to you within 48 hours of receipt of your order! E-direct is just another way we strive to make things easier and more efficient for our customers and partners.

We are also extremely proud to have been recognized by Frost & Sullivan with the 2016 Global Company of the Year Award for Water Analysis Instrumentation. If water or wastewater factor into your processes, look to us for world-leading (read: award-winning) liquid analysis products, services and solutions.

Also in the pages ahead, you'll find a white paper on a Refinery Application. Uncover ways to improve overall measurement reliability. Discover how you can decrease alarm counts associated with redundant level devices not matching. The importance of Gas Phase Compensation (GPC) is discussed and how it affects level readings of Guided Wave Radar (GWR) devices. Additionally, the impact of high temperature and/or pressure on level readings where GPC is not activated is another one of the issues discussed. The white paper addresses these issues and the ways to overcome them.

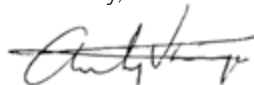
I am sure this has been a very challenging year from most, if not all of you – and no immediate end is in sight relating to the economic effects of the price of oil. The effects on our businesses have put us all under cost pressures with additional complexity added if the US is a source of our goods ... such as it is with Endress+Hauser Canada. We have worked hard this year to control and reduce our cost structure while maintaining our experienced and committed colleagues – and we are continually striving to help you cut costs and add value to your operations.

Our new Contact Sales team is in place to help us serve our smaller customers far more effectively by providing them the focus and attention they deserve, and to help identify opportunities to grow business and support. Another aspect of our business that is not well known is our Service and Solutions organizations, which have close to 50 associates committed to the delivery of first-class field service and calibration experience, or delivering well-defined solutions to help solve real-world problems such as complex tank gauging, leak detection, lifecycle management and field network engineering.

You will hear much more about this in upcoming letters as we step up our efforts to provide our valuable customers and partners a “one stop shop” experience.

At Endress+Hauser, we are all committed to delivering meaningful and tangible ways to help you be the leader in your industries. Together, in a spirit of partnership, there's nothing we can't accomplish successfully together. Look to us to help you to be as efficient and competitive as possible.

Sincerely,



Anthony Varga  
President and CEO



## We've moved!



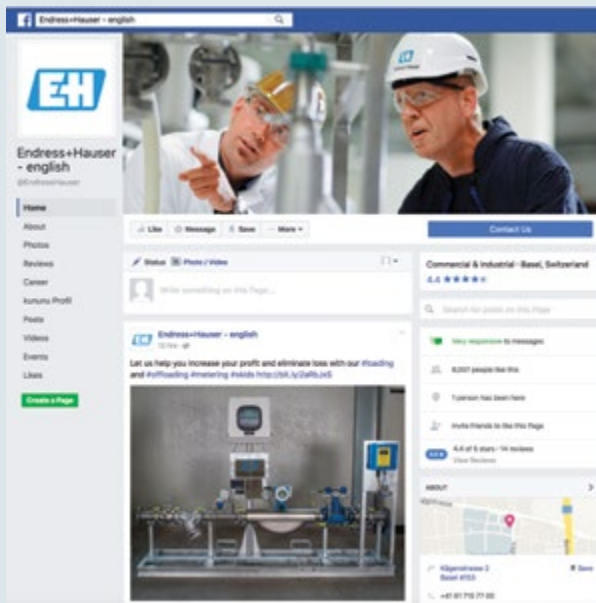
us for a chance to **WIN** a BOSE Soundlink Bluetooth Speaker



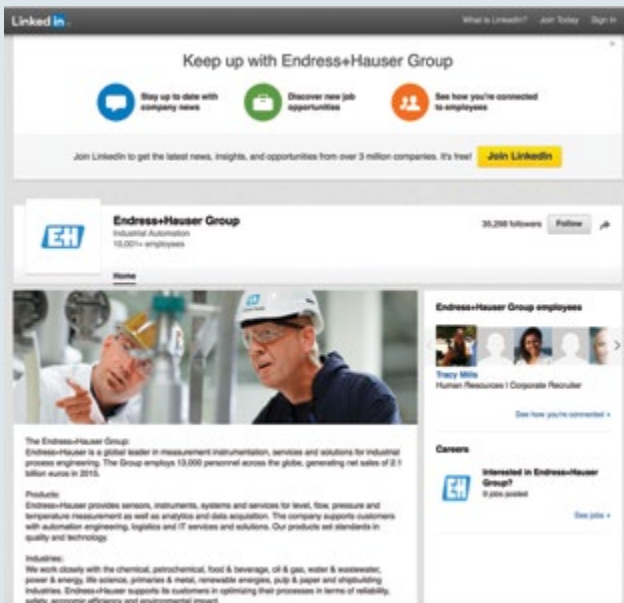
## 2 Networks – 2 Chances to WIN!



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"Like" and "Follow" Endress+Hauser in our NEW Facebook and LinkedIn locations between September 5 to December 31, 2016 to be automatically entered in a draw\* for a chance to **WIN** a BOSE Soundlink Bluetooth Speaker.



**Full rules and regulations:**

[www.ca.endress.com/Endress-Hauser-Group/BOSEcontest](http://www.ca.endress.com/Endress-Hauser-Group/BOSEcontest)

\*Not valid in Quebec.  
Some restrictions apply.



# FROST & SULLIVAN

## BEST PRACTICES RECOGNITION



## 2016 Global Water Analysis Instrumentation Company of the Year Award

*Press statement, Frost & Sullivan*

### Who is Frost & Sullivan?

Frost & Sullivan is a leading, 55 year-old market research and consulting firm that tracks multiple industries including Automotive, Healthcare, Information and Communication Technology, and more. Headquartered in Mountain View, California, Frost & Sullivan employs 1,800 analysts and has offices in over 40 countries.

### What are the Best Practices Awards?

The Frost & Sullivan Best Practices Awards have identified exemplary achievements within a multitude of industries and functional disciplines for the last 16 years. Frost & Sullivan conducts best practices research to properly identify unrivaled innovation and leadership among companies, products, processes, and executives.

Receiving the Frost & Sullivan 2016 Global Company of the Year is a compelling, third-party validation of a company's growth strategy and execution. Endress+Hauser's Best Practice Award is a very strong indicator to employees, investors, customers, and the public that Endress+Hauser has superior solutions and a viable strategy in the water analysis instrumentation market.

### Why Endress+Hauser?

Endress+Hauser has consistently addressed unmet customer requirements by introducing products and technologies that redefine the concept of liquid analysis. Its Memosens technology converts the measured analysis value to a digital signal and transfers it to a transmitter without involving a contacting connection, thereby eliminating all issues related to moisture and corrosion. In the event of any disruption in signal transmission, the option of alert messaging further decreases the rate of error in measurement. By leveraging its decades of experience, rich engineering expertise, and in-depth technical know-how, Endress+Hauser has devised a strategy to offer the best value to its broad customer base.

Based on recent analysis, Frost & Sullivan recognizes Endress+Hauser as the recipient of the 2016 Global Company of the Year Award.





To receive the Frost & Sullivan Global Company of the Year Award requires a company to demonstrate excellence in growth, innovation and leadership.

This kind of excellence typically translates into superior performance in three key areas:

1. demand generation,
2. brand development, and
3. competitive positioning.

These areas serve as the foundation of a company's future success and prepare it to deliver on the two criteria that define the Frost & Sullivan Global Company of the Year Award (Visionary Innovation & Performance and Customer Impact). The concept is explored further below.

#### Demand

- Acquire competitors' customers
- Increase renewal rates
- Increase upsell rates
- Build a reputation for value
- Increase market penetration

#### Brand

- Earn customer loyalty
- Foster strong corporate identity
- Improve brand recall
- Inspire customers
- Build a reputation of creativity

#### Competitive Positioning

- Stake out a unique market position
- Promise superior value to customers
- Implement strategy successfully
- Deliver on the promised value
- Balance price and value



## Significance of Global Company of the Year Award

### Key Benchmarking Criteria

For the Global Company of the Year Award, Frost & Sullivan analysts independently evaluated two key factors – Visionary Innovation & Performance and Customer Impact – according to the criteria identified below.



### Visionary Innovation & Performance

- Criterion 1: Addressing Unmet Needs
- Criterion 2: Visionary Scenarios Through Mega Trends
- Criterion 3: Implementation Best Practices
- Criterion 4: Blue Ocean Strategy
- Criterion 5: Financial Performance

### Customer Impact

- Criterion 1: Price/Performance Value
- Criterion 2: Customer Purchase Experience
- Criterion 3: Customer Ownership Experience
- Criterion 4: Customer Service Experience
- Criterion 5: Brand Equity

## How Can Endress+Hauser Work for You?

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## Refinery Application

By: Bill Sholette, Level Product Business Manager – Endress+Hauser

Chris Fournet, Level Product Business Manager – Vector Controls & Automation Group

### Improve reliability and decrease alarm count

The purpose of this article is to discuss how to decrease alarms due to redundant level devices not matching especially in applications with high pressure and/or high temperature. The importance of Gas Phase Compensation (GPC) and how it affects level readings of guided wave radar (GWR) devices is critical. The presence of polar gas also can have an effect on the accuracy of any GWR that does not have GPC when installed in applications where high temperature or pressure is present. This paper will discuss these issues and address how to overcome them.

Are you experiencing deviation alarms in your high pressure process vessels? In many high pressure vessels, redundant level measurement technologies are employed to provide multiple level indications for safety. It is common for the level measurement instruments to be different technologies in order to provide what is referred to as “diverse redundancy.” Conceptually, diverse redundancy is a great idea. A process condition that may affect one technology will likely not affect the other(s) ensuring that a reliable level measurement is being provided by at least one technology.

This concept does introduce additional issues and concerns. From a safety standpoint, double or triple redundancy provides additional security. However, it also introduces the need to monitor each level measurement technology to compare the outputs and provide an alarm if the outputs deviate by a pre-determined percentage. While it is true that a process condition may “upset” a particular technology, it is very difficult to determine which of the redundant technologies is in an upset condition and which is operating properly. For safety reasons, it becomes necessary to take corrective action

whenever the deviation between the level measurements exceeds this predetermined value.

In the case of high pressure process vessels, safety is of paramount concern. Diverse redundant level measurement is common in these applications to ensure safe operation. It is important to select technologies that are reliable and repeatable to reduce alarms due to deviation.

One technology that has become very popular for level measurement in high pressure vessels in recent years is Guided Wave Radar (GWR). Guided wave radar, also called time-domain reflectometry, is a time-of-flight level measurement technology. A microwave pulse is launched from the transmitter and follows a wave guide to the surface of the material being measured. The change of impedance created by the change from the gas phase to the material being measured causes the microwave pulse to reflect and return to the transmitter. The time the pulse takes to reach the material surface and return is divided by two, which provides the distance to the material being measured and allows the level to be calculated.



Levelflex FMP54

As with any measurement technology, it is important to understand how an instrument will function in the application in which it is being applied to. This is particularly true of guided wave radar transmitters in high pressure vessels. Typically, guided wave radar will send a pulse through the upper gas phase in the vessel to reflect off of the liquid (or solid) material being measured. In most applications, this is very efficient and provides a reliable and repeatable level measurement. However, in high pressure applications where the upper phase is made up of a gas with a polar molecule, special consideration needs to be taken to attain this repeatable measurement.

Polar molecules alter the speed of the microwave pulse. The microwave is slowed by the polar molecule resulting in an error in the measurement. Common polar molecule gases are steam ( $H_2O$ ), hydrogen, and ammonia. When these gases are present as the upper phase in high pressure vessels level measurements using guided wave radar will result in an error unless the reduction in speed of the microwave pulse is compensated. Polar gas depending on what type and what concentration, can dramatically affect the accuracy of the measurement of a GWR device. When a polar gas is present in the “Gas Phase” of a level application, the indicated level reading from the GWR will be less than the actual process level. This happens because the speed of the GWR pulse slows as it propagates through the upper polar gas phase. Since the level measurement is based on time – this causes an error and can result in alarms if this is another level technology being used in the same vessel

For an example, let’s consider a steam drum application. The steam above the liquid water in the drum is made up of a polar molecule ( $H_2O$ ) which will change the speed of

the radar signal in the gas phase area. This creates an error in the level reading which will be proportional to the pressure and temperature. The chart in Figure 1 shows the percent error based on temperature and pressure. Note that in a high pressure steam drum at 2,900 psi the error would be as high as 76%. This error is not acceptable for safety or for measurement purposes. Even at lower pressure you can see the error can be substantial. This becomes important also when other level devices are measuring the same level and a deviation alarm is configured to look at the difference between level transmitters. In many cases, this could result in a deviation alarm.

Clearly, when using guided wave radar for measurement in high pressure applications with polar molecules in the gas phase, some way to correct for the resulting error must be made. Calculations for correction can be made based on pressure and temperature measurements however, these corrections would need to be recalculated with every pressure change. This can be problematic especially during startup operations.

A guided wave radar can be manufactured with a reference section that provides the required compensation. Figure 2 illustrates the reference concept. A reference rod is added to the wave guide near the top of the sensor. This reference rod is slightly larger than the measuring rod. When the microwave pulse reaches the end of the rod it will see a change of impedance causing a reflection back to the transmitter. Since the reference rod is in a fixed location the reflection from the rod should always be in the same location. As the pressure in the vessel increases and the microwave pulse begins to be affected by the polar molecules, the reference point will begin to look like it is further down the sensor.

Gas phase	Temperature		Pressure							
	°C	°F	1 bar 14.5 psi	2 bar 29 psi	5 bar 72.5 psi	10 bar 145 psi	20 bar 290 psi	50 bar 725 psi	100 bar 1450 psi	200 bar 2900 psi
Steam (water vapor)	100	212	0.26%							
	120	248	0.23%	0.50%						
	152	306	0.20%	0.42%	1.14%					
	180	356	0.17%	0.37%	0.99%	2.10%				
	212	414	0.15%	0.32%	0.86%	1.76%	3.9%			
	264	507	0.12%	0.26%	0.69%	1.44%	3.0%	9.2%		
	311	592	0.09%	0.22%	0.58%	1.21%	2.5%	7.1%	19.3%	
	366	691	0.07%	0.18%	0.49%	1.01%	2.1%	5.7%	13.2%	76%

Figure 1: Percent error based on temperature and pressure



### Gas Phase Compensation: Construction/Preconditions

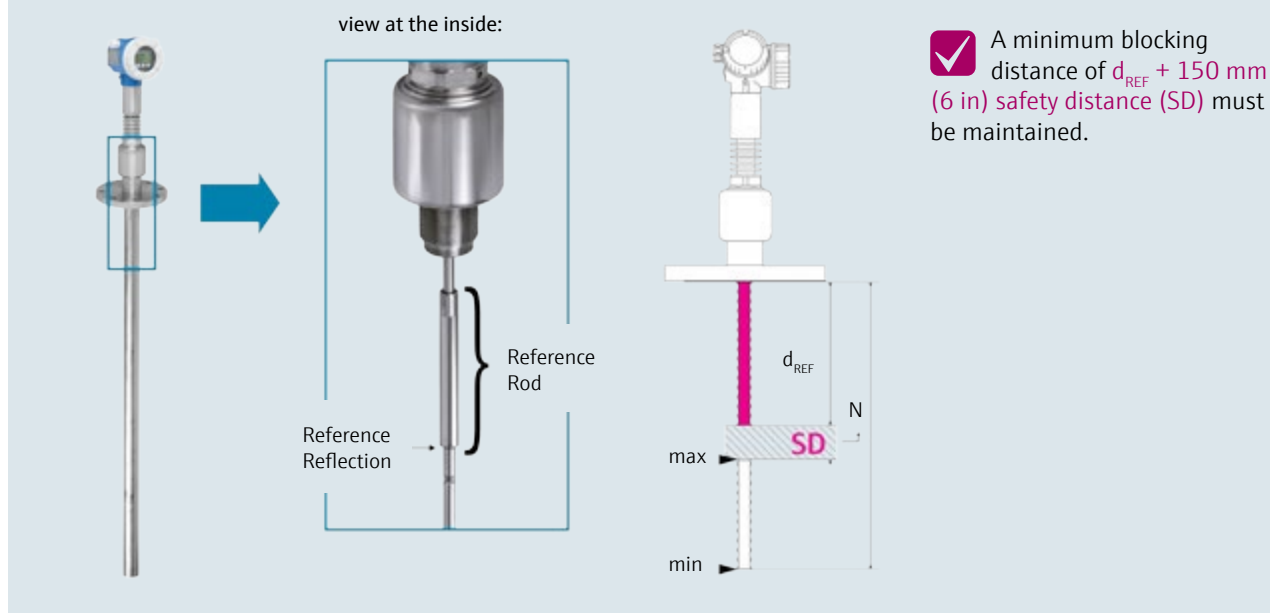


Figure 2: Gas Phase Compensation; Construction/Preconditions

The transmitter can use the differential between where the reference is expected to be to where it is reporting to be to compensate for the speed change and thereby provide a correct level measurement (see Figure 3). Gas Phase Compensation using the reference rod is a dynamic real

time correction. That is, the correction is ongoing and compensates for changes in pressure that occur during the operation of the process. This is particularly helpful during startup and shut down operations when pressure is changing dramatically.

### Gas Phase Compensation: Function of automatic compensation

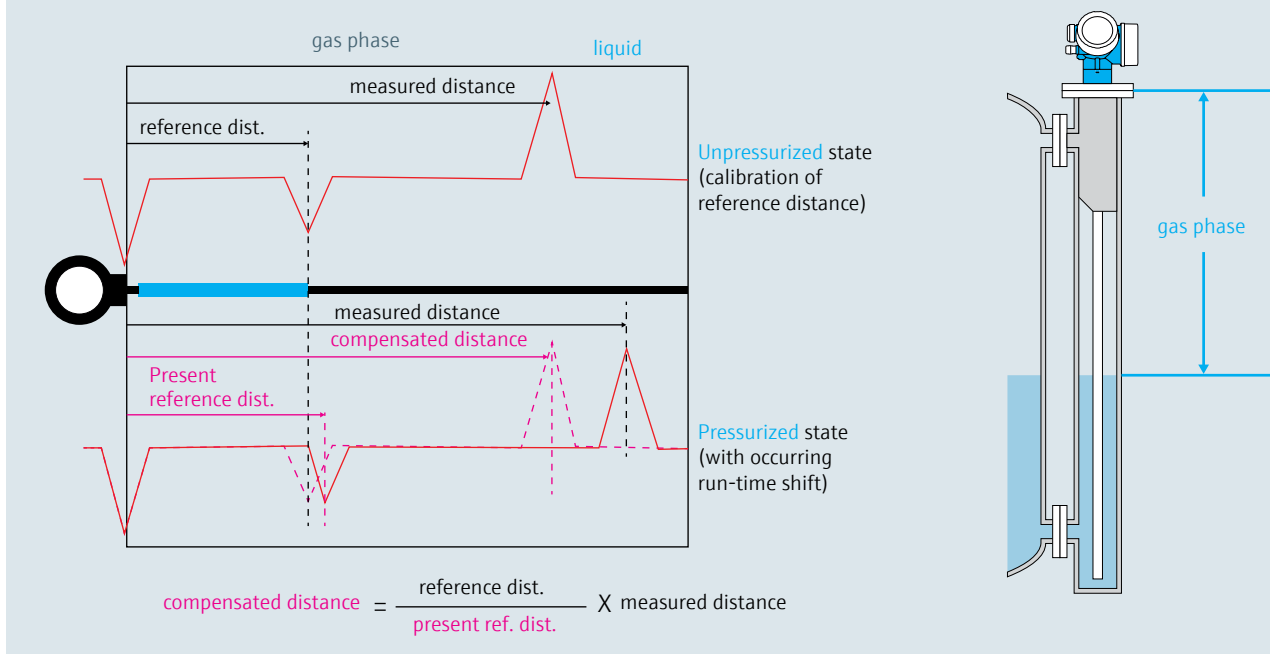


Figure 3: Gas Phase Compensation, function of automatic compensation



Guided wave radar transmitters are an excellent choice for many level measurement applications. For high pressure vessels containing gases with polar molecules, a reliable and repeatable measurement is achievable. It is important to select guided wave radar that provides gas phase compensation to correct for changes in speed of the microwave pulse.

**Endress+Hauser Solution:** Many level refinery applications have high pressure/temperature steam or hydrogen present in the upper gas phase. In many cases, there is a 10% deviation alarm in place to help ensure a reliable level reading is always achieved. Most of the time when multiple level devices are used, refineries elect to use different technology on these devices such as a wet-leg Dp, Capillary Dp, Magno-restrictive and GWR. In applications such as this, it's obvious to see how polar gas affects a level reading. What you would expect to see is the GWR showing a lower reading than the rest of the level devices. Of course, the only way to truly see this deviation is when all the other instruments are calibrated and set up properly.

Endress+Hauser recognized the effect polar gas has on GWR and developed a device that compensates for the level deviation. The FMP54 was developed specifically for high pressure and temperature applications with a unique

reference rod built-in to the top section of the unit to combat the issue of polar gas. With this technology, Endress+Hauser can ensure reliability and accuracy on these types of applications and minimize deviation alarms.

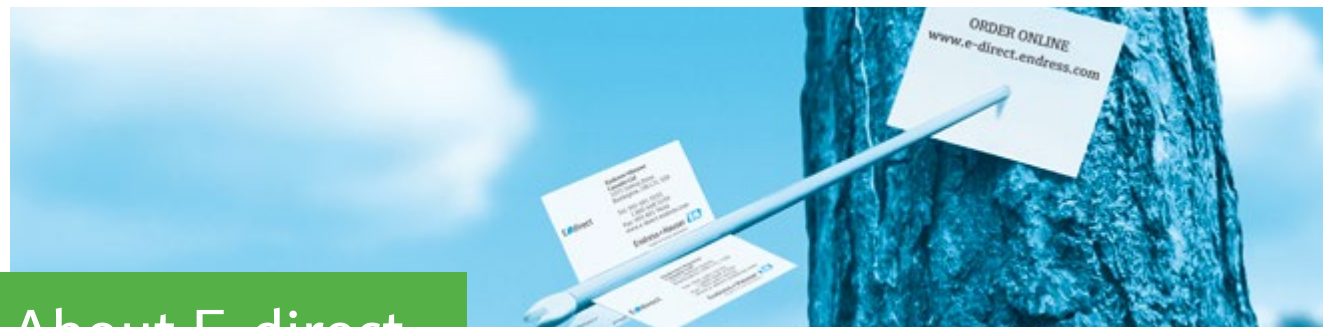
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Bill Sholette is the Level Product Business Manager for Endress+Hauser in the Northeast. Bill has been involved in level measurement for the past 33 years in virtually all aspects of process level measurement instrumentation—from manufacturing and sales, to his present position in product management. He is currently responsible for level products in Northeast United States. Bill attended Villanova University and has certification in management and marketing.

Chris Fournet is the Level Product Business Manager for Endress+Hauser and Vector Controls & Automation Group in the Central US. Chris has been involved with instrumentation for the past 25 years with a focus on level measurement for the last 10 years. He spent 22 years in one of the largest refineries in the USA, ending his career there as the Instrument QA/QC Specialist. He is currently responsible for level, pressure and temperature products in Central United States which include TX, NM, OK, KS and MO. Chris attended Lamar University with a degree in Instrumentation and is also CCST certified from ISA.

# E-direct

High Quality – Low Price!



## About E-direct

### What is E-direct?

E-direct complements the traditional range of products from Endress+Hauser. Certain instruments do not require a vast amount of consultation in terms of application and price – that's where E-direct can help. It's a product portfolio that offers simple product selection and fast delivery at an affordable price.

### Who is Endress+Hauser?

Endress+Hauser is a global leader in high quality and innovative measurement instrumentation, services and solutions for industrial processes. With dedicated sales centers and a strong network of partners, Endress+Hauser guarantees competent worldwide support.

### What does E-direct offer me?

- Simple product selection
- Value for money
- Transparency thanks to quantity discounts being displayed
- Short delivery times
- Exchange of defective instruments

### How can I place an order?

You can place your order with us online or by contacting our sales office at 1-800-668-3199



Shop now!

[www.e-direct.endress.com](http://www.e-direct.endress.com)

### How can I pay?

You can pay online using a credit card (MasterCard - Visa) or by purchase order number with pre-approved credit. Orders paid by Credit Card will be processed immediately. Orders purchased on pre-approved credit will be invoiced with terms.

### Invoicing for current customers

If you have an established account with Endress+Hauser and your account is in good standing, your order will be immediately processed and an order confirmation will be sent to you. An invoice will then be sent once the order is shipped. Endress+Hauser Canada Ltd Terms and Conditions of Sale apply.

### Invoicing for new customers

You will be contacted by an Endress+Hauser representative to set up your account after you submit your order. This will include completing a credit application. Upon approved credit, an order confirmation will be sent to you once your account is established. An invoice will then be sent when the order is shipped. Please review Endress+Hauser Canada Ltd. Terms and Conditions of Sale for further details.

### Consultation

Our technical experts are available during office hours to answer any questions you may have regarding our E-direct products and their application at 1-800-668-3199.

### Warranty

Please refer to the Endress+Hauser Canada Ltd Terms and Conditions of Sale for further details.

### Dispatch times

Placing your first order using a credit card will ensure prompt dispatch. If you opt to place your first order by purchase order number, the dispatch of your ordered items may be delayed whilst we organize your account and Proforma invoice.

#### PLEASE NOTE:

- The dispatch time displayed alongside each product is an indicator e.g. 48 hours or 5 working days (for three identical units) and will be confirmed in your order confirmation. This dispatch time applies for orders placed before 09.00 a.m.
- Our dispatch times may sometimes be longer than 48 hours or 5 working days. Should this happen you will be advised by the dispatch time indicator.



= 48 hours (Your order will be dispatched on the second working day after order placement)



= the indicated number of working days

Shipment by Air Express is available at an additional cost.

# Tank Gauging

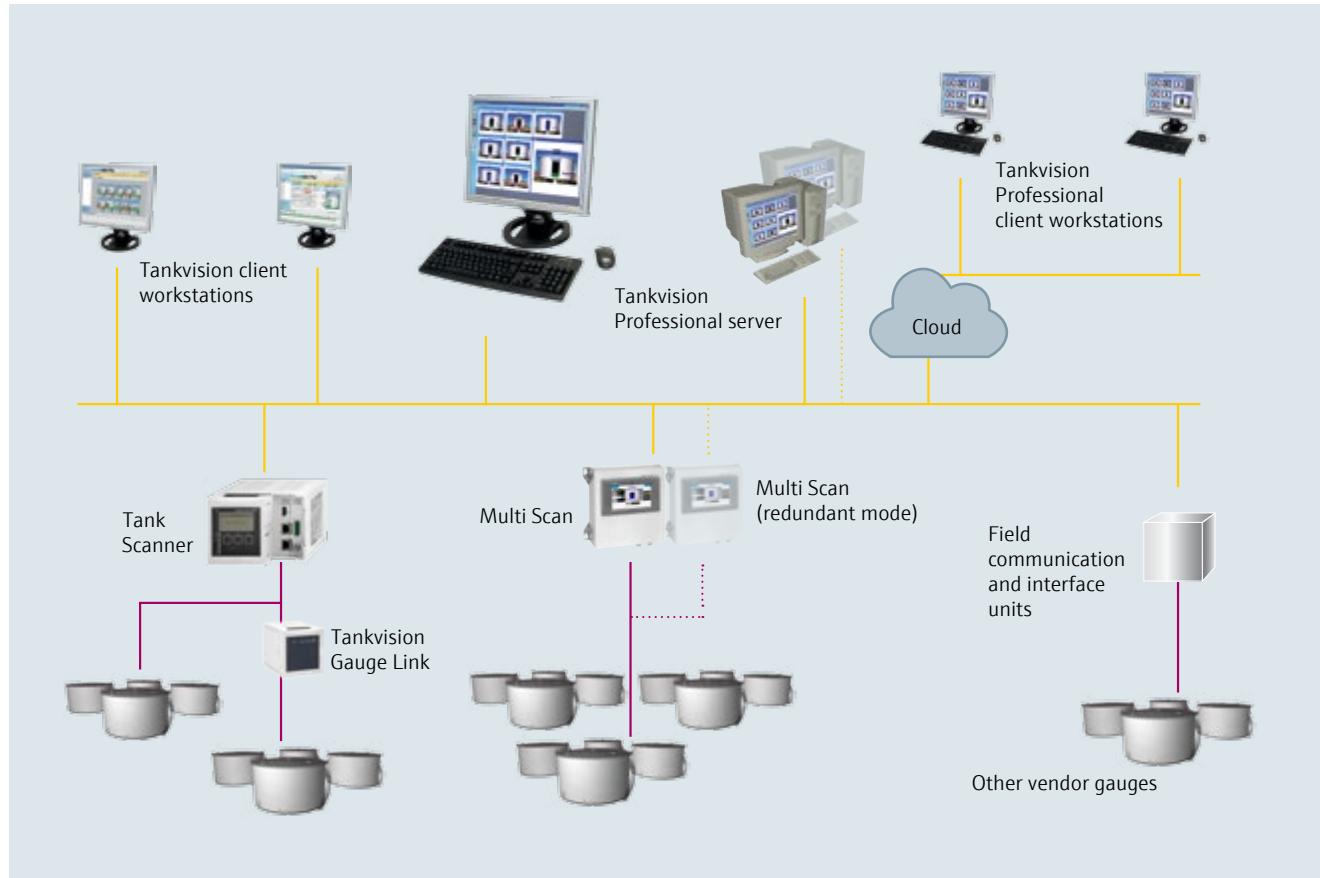
Endress+Hauser offers controlling and monitoring of the inventory of your tank with state-of-the-art solutions and highest accuracy level measurement instrumentation.

Endress+Hauser offers a complete choice of technologies to support the right decision on the most suitable tank gauging system for your individual application. You may decide to maintain your current system or embark on a step-by-step migration path to state-of-the-art technologies. Endress+Hauser can offer complete solutions from (highly precise) measurement via data acquisition and data processing through to publication to on-site or remote users.

## Endress+Hauser offers:

- Reliable and secured tank data collection
- State-of-the-art level (radar and servo) and temperature measurement technologies with industry proven communication protocols allow accurate measurements and data collection. NMI and PTB certificates as well as local approvals for the products according to OIML R85
- The uncompromising usage of web server technology allows easiest access to tank data and comprehensive data presentation to anyone in need
- Approved and certified (by W&M authorities) instrument and system solutions

## Tank gauging systems summary





# Inventory control

Endress+Hauser offers simple monitoring and visualization of tanks and silos.

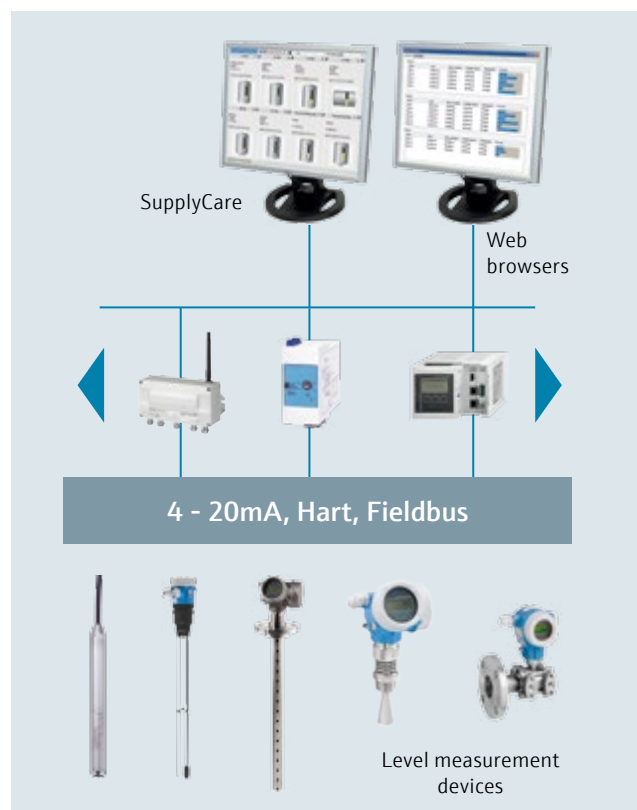
Providing you with the relevant decision-making information, Endress+Hauser offers systems for simple visualization of inventory quantities. You have the choice of any relevant field device, field communication protocol and several options to visualize the relevant information for your planning, analyzing and decision making processes.

The inventory management software, SupplyCare, allows to display the quantities, trending, as well as working with alert indicators for your stocks. You have the choice between a hosted version on a redundant server infrastructure at Endress+Hauser or an Enterprise version, which is installed on your server infrastructure.

**In good hands – a single point of contact for all your needs across Canada**



Accurate tank gauging in good hands.



## Your benefits

- Accurate, safe and reliable measurement through high-quality products
- Exact information in real time for profound decision making
- Lower capital and operational costs thanks to improved material availability and reduced inventory



## Services

- Standard/extended/advanced commissioning
- Standard/extended/advanced inspection
- Software update service
- Remote inventory service
- Verification based on manual dipping
- Hosting inventory management
- Business process consultancy

# Edirect Products Spotlight

## Cerabar PMC131

Absolute and gauge pressure measurement

from \$239



- Cost-effective and compact pressure transducer for measurement in gases or liquids
- Dry capacitance ceramic sensor (Ceraphire)
- Overload-resistant high purity ceramic sensor (99.9%  $\text{Al}_2\text{O}_3$ )
- Best fit for vacuum applications and applications with abrasive media

## Easytemp TMR31

Compact, fast and precise thermometer

from \$101



- Small, compact design made entirely of stainless steel
- Fulfills the requirements of modern process measurement technology with cost efficiency, optimal use of space, reliable operation, easy installation and commissioning
- Vibration-proof integrated thin-film sensors guarantee highest operational safety at the fastest response times

## RN221N

Active barrier with optional HART® diagnosis

from \$253



- Wide range power supply, flexible power source
- Bidirectional HART® transmission. Communication sockets for HART® sensor setting up. Evaluation of status information from connected transmitter with HART® protocol
- Manual or automatic reset of the relay contact

## RIA15

Loop-powered indicator for 4 to 20 mA or HART® signals

from \$205



- Display of 4 to 20 mA measured values or optionally up to four of a sensor's HART® process variables in all industries
- Use as primary or secondary HART® master
- Minimal installation depth
- No external power supply required
- Easy three-key operation for configuring the device



Shop now!

[www.e-direct.endress.com](http://www.e-direct.endress.com)

## Cerabar PMP131

Absolute and gauge pressure measurement

from \$257



- Price-attractive compact pressure transmitter with piezoresistive sensor with metallic measuring diaphragm
- Overload-resistant sensor up to 400 bar
- Small flush-mounted process connections

## Soliphant FTM20

Vibronic point level detection for solids

from \$520



- For applications with fine-grained or coarse-grained, non-fluidized bulk solids
- Operational safety, reliability and universal applicability through use of the tuning fork measuring principle
- Measurement is unaffected by conductivity, build-up, turbulence, flows or air bubbles
- Simple and fast commissioning, no calibration required
- No mechanically moved parts, free of maintenance

## Liquiphant FTL33

Vibronic point level detection for liquids

from \$248



- Especially designed for food & beverage applications
- Used for overflow prevention or pump dry-run protection preferably in storage tanks, mixing vessels and pipes.
- Compact: smallest vibronic sensor in the market
- Safe: continuous self-monitoring and reliable switching independent of media properties
- Easy: no calibration or adjustment; plug & play

## Minicap FTC260

Capacitance point level detection

from \$262



- Designed for light bulk solids, particularly suited to applications involving aggressive media and heavy build-up
- Cost-effective, simple mounting and commissioning without calibration
- Mechanical safety, cost-efficiency and long operating life due to no wearing parts
- High operational safety and reliability due to active build-up compensation



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People for Process Automation