

# Profiles

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Customer Magazine 2/2018

Honeywell Connected Gas – Welcome to a New World of Insights

Diaphragm Gas Meters - Wind of Change

FORCE – The World's Largest Closed Loop

#### Editorial

## **Smart Energy for Today and Tomorrow**



#### Jon Smith Vice President and General Manager, Gas Americas Smart Energy

In the utility space, we've long heard of the benefits of a connected utility strategy, in particular the benefits of advanced metering infrastructure, or AMI. When it comes to natural gas, we've seen some gas utilities fully embrace the AMI transformation and its technology components, including smart meters and other connected solutions. For others, adoption has not been as fast.

It's not hard to understand why some gas utilities might be hesitant. No two utilities are alike, and an implementation that works for one utility might not work for another. For example, compare urban utilities to rural utilities. From the outset, the time and cost savings resulting from a smart meter rollout in a dense urban environment can be significant. In contrast, the economics of the same type of installation are very different in a rural setting. Fortunately, the move doesn't have to be a one-size-fits-all approach.

Adopting the right network approach – with the right technological components and capabilities – is critical for successful AMI implementation. Utilities increasingly have a menu of choices: They can build their own network; have a private network built and maintained by a third party as a service; or even tap into an existing network infrastructure. For utilities that do want to build their own network, the one they build should be flexible enough to meet current demands while providing room to grow and evolve. This might mean starting with collecting meter data while leaving open the option to add features such as remote shut-offs, detection, and asset tracking at a later date.

With a flexible network, utilities can also incorporate other services to benefit consumers while ensuring network security and data integrity. This includes enhanced accounting for gas delivery and more easily pinpointing when and where lost and unaccounted-for gas delivery occurs.

Connectivity has the potential to have a real impact not only in the home but also in utility operations. Utilities can enable more connected operations with simple steps such as implementing sensors to enable greater information-sharing between key meter and flow points, encompassing upstream, midstream and downstream points, which can help reduce problems and enable more efficient delivery.

With these connections in place, utilities can layer on capabilities such as data and predictive analytics. For example, implementing sensors at gate stations can help drive deeper efficiencies with downstream processes. With analytics in place, utilities can then automatically identify potential problems at specific points long before they become issues that affect operations. This could help continue to enhance the safe delivery of natural gas across the country.

Regardless of where they now stand on their journey to a connected utility model, gas utilities of all sizes and in all geographies can begin thinking about the potential that connected solutions offer them in terms of driving performance and customer engagement down the line.

Yours, Jon Smith

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#### Honeywell Connected Gas

### Welcome to a New World of Insights

The whole world is talking about Industry 4.0 or the Internet of Things. You cannot open a newspaper today without some scientists providing an opinion about the future of work or some concerned union leader warning of the dangers of laborers being replaced by robots.

#### Just New Wine in Old Wineskins?

For Honeywell and our customer base, the real question is "what is new?". Honeywell has been providing connected solutions to the utility industry since the late 80s of the prior century. Many, if not all, our devices in the field provide some form of connectivity to gather data and transport it securely to a central facility. The utility industry itself has been on the forefront of the whole "smart" wave, having started smart grid and smart city projects all the way back in the early 2000s. What is new then – or is it just new wine in old wineskins?

#### **Going Deeper and Broader**

If you analyze the current solutions deployed in the utility industry at large, these solutions are designed for a single purpose: Billing – when talking of distribution networks and SCADA or device management for the large transport network providers.

The new wave of connectivity solutions goes beyond these single-purpose networks. Through providing more and more granular data from the devices installed out in the field, we get a substantially more holistic view – we are broadening our knowledge base to take better decisions. And because we live in the 21<sup>st</sup> century, where mobile devices and massive computing power are available to everybody every day, the way we present this information to you, our customers who need to take these decisions on a daily basis, is changing as well.



Gone are the days of massive spreadsheets like user interfaces that try to display all available data on a single screen. Modern systems from

Modern systems from Honeywell intelligently select only the data that you really need to see to make a call. Honeywell intelligently select only the data that you really need to see to make a call.

Do not worry, the details are still available to you should you desire

to dive deeper down the rabbit hole. But the good old 80:20 rule applies here as well – in 80% of the cases, you will not need all the details to make an informed decision, only in 20% will it be necessary to look at granular information.



#### Show Me the Money

For Honeywell to simply provide you with the same information that we have provided before, just more granular and more focused cannot be sufficient – after all, the decisions you would make would be the same, so the value to you would be limited at best.

Honeywell's Connected Gas solutions aim to go beyond that. By using the power inherited in realtime communication, we are securely connecting your field workers directly to the subject matter experts in Honeywell's service centers. By using the power of the Cloud and its unlimited computing capabilities, we provide your measurement team with predictive information that tells them about a potential problem before it happens – not afterwards. And by using mobile devices and platforms in a secure way, we provide that information anytime and everywhere – no matter if you are on the road or in your headquarter office.

#### It All Starts With the Customer

Our journey starts at the end – the point where your end customer uses the gas at their house to heat their building or to cook their meal. Honeywell's Residential Thermal Solutions and Honeywell's SMART Connectivity solutions have been providing end customer connectivity for years. Intelligent metering indexes like the themis XX or themis YY connected to arguably the best residential meter design in the business, the Honeywell BK meter, provide connectivity using cellular and radio connectivity from LTE, CAT-M, and NB-IoT to 169 MHz, LoRa, and ZigBee.

This year, Honeywell's Connected Gas solutions are upping the ante by extending our marketleading Powerspring® meter data collection system to become THE universal platform for meter data collection for gas at Honeywell. One MDC to rule them all – no more dealing with multiple IT systems, databases, additional cyber security risks (all Honeywell Gas solutions are extensively vetted by the Honeywell Cyber Security team). And as our customers come in all shapes and sizes, so too does Powerspring® – no matter if you want to connect five or five hundred thousand devices – Honeywell's got you covered.



Consumers are only one part of the utility industry's end customer equation. The other, much bigger part – at least by gas volume – is the commercial and industrial customers

we serve together – from the 'Ma & Pa' pizza shop around the corner to the multi-national aluminum manufacturer with sites around the globe. On the metering side, Honeywell's rotary and turbine solutions have always been connected. Using the EK and Mercury series of volume converters with external or inbuilt cellular and Ethernet communication, we have ensured reliable and secure communication to the corporate SCADA or billing systems for decades.

We provide your measurement team with predictive information that tells them about a potential problem before it happens – not afterwards.

### 



This year, Honeywell's focus will all be on reducing your cost to service these assets in the field. Starting with the new Cloud Link R110, the first LTE Cat M1 industrial modem in the industry. The new cellular technology provides lower power consumption and better range, allowing our customers to extend their service intervals and thereby greatly reduce service costs.

If and when a service is really necessary, the new version of MasterLink MOBILE, which is available for Android and iOS devices, will for the first time allow you to directly connect your service engineer with the TAC experts in the Honeywell data center. And we are going a step further – we give YOU the capability to give Honeywell's Service team direct access to the device in question to fix the issues at hand. The result: No more repeat visits, no more "can you repeat that please?", no more "what is the display saying now?" – more efficiency, faster turn-around, real money saved.

#### Serving Your Country

We started this article by talking about insights. What better part of the gas grid to provide these insights than the large transport networks that span our countries and that provide gas to every corner of the globe.

Due to the large volume transported in these global networks, every tiny bit of disturbance or imbalance counts. Honeywell's ultrasonic meters Q.Sonic<sup>plus</sup> and the new Q.Sonic<sup>max</sup> are second to none in their immunity against adverse flow or particle conditions in the gas stream, due to our patented reflective path design. However, in these high-volume applications, the meter is just one part of the equation. Regulators, valves, gas composition or changes in the actual piping material play as important a role in your accuracy as the meter itself.

Here, Honeywell's Connected Assets Measurement IQ for Gas comes into play. Measurement IQ does not only monitor your meter, but also builds a holistic picture of the overall performance of your metering skid by taking into account data from temperature and pressure sensors, gas chromatographs, and flow computers. By comparing this snapshot with the actual measurement data provided by all these devices at any given time, we can tell when the performance starts to deteriorate long before any critical limits are reached.

And because it doesn't help you when this information pops up just on a central system somewhere where you might or might not be able to address this immediately, we provide all of this in a small-footprint mobile app right there on your phone or tablet.

So, from your neighborhood all the way to the gas wells out in the ocean – Honeywell is taking our market-proven connectivity solutions, broadening their scope, and easing their accessibility to give you, our customer, real value from Connected Gas.

Max Gutberlet max.gutberlet@honeywell.com

### Welcome to Canada!

Great milestone ahead – Honeywell is proud to announce that the RABO® is about to go on air within the next weeks. The official approvals required in Canada are about to be finalized.

RABO® rotary gas meters from Honeywell have been in use successfully in the USA for some considerable time, delivering a wide range of benefits to customers. The extensive product range will now shortly also be available to municipal utilities and industrial customers in Canada. Similar to Europe, the product approval of measuring instruments for the gas industry is subject to three main regulations with which they must comply:

- Local pressure vessel code (CRN)
- Measurement accuracy requirements for rotary gas meters (Measurement Canada)
- Local explosion protection requirements (CSA)



Only if all the specifications and requirements of these regulations are satisfied may a meter be installed and operated in the gas industry for fiscally certified consumption measurement. Honeywell started this approval process in Canada several months ago for the rotary gas meter RABO® and initially received the CSA approval in spring 2017 (see Fig. 1). At the same time, another authority was working on the product approval based on the requirements of the pressure vessel code (CRN) which is issued separately for each Canadian province (Fig. 2). The last of the total of 13 provinces in Canada, Manitoba, issued the required CRN approval in May 2018.

The only outstanding item now is the formal certification of the measurement accuracy requirements from Measurement Canada, which will be issued in a few weeks. The tests on the RABO<sup>®</sup> are already in full swing (Fig. 3) and the feedback we received after the first tests has been very positive. The metering expert at Measurement Canada responsible for the certification told us: "Your meter is performing excellently" – which clearly highlights the high quality and performance of the rotary gas meter from Honeywell.

Finally, we have also ensured that the word mark RABO<sup>®</sup>, which is well known in the gas world all over the globe, is now also a protected registered trademark in Canada (Fig. 4).



Fig. 3: RABO Undergoing Tests at Measurement Canada

All in all, municipal utilities and industrial customers will now be able to enjoy a new range of products on the market, alongside established manufacturers, and can look forward to benefiting from the unique features of the RABO<sup>®</sup>. It offers the same strengths and wide range of configurations as the RABO<sup>®</sup> product range in the USA, which was described in detail in recent editions of the Honeywell magazine (see 1/2017 and 3/2017 editions). Why not find out for yourself and become acquainted with the RABO® rotary gas meter, for example at the World Gas Conference in Washington D.C. from June 25 – 29, 2018. Honeywell will be exhibiting several interesting new products there at Booth 1703, directly off the main WGC walkway. We look forward to seeing you at our exhibition booth and providing you with more information. Your opinion is important to us!

Patrick Keiffer

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Fig. 1: CSA Certification of the RABO® From the CSA Group

Fig. 2: CRN Certification of the RABO® From TSSA

Fig. 4: RABO® Trademark Certification in Canada

#### Information about Changes to Diaphragm Gas Meters

# Wind of Change

"Learning is like swimming against the current – if you stay still, you go backwards!" (Erich Kästner). There is no doubt that we want Mother Nature to be intact, our water clean, plants and animals healthy, and food safe to eat. We cannot afford to stay still or go backwards in this respect.

> The European Union (EU) has enacted the RoHS Directive, the REACH Regulation and the WEEE Directive to protect human health and the environment. RoHS and REACH are aimed at avoiding harmful substances in production processes and products. WEEE concerns the avoidance of waste from electrical and electronic equipment. The aim of manufacturers placing products on the market in the EU is now to implement these requirements on a commercially sound basis. With the support of our suppliers, we have managed to achieve these objectives, naturally without any reduction in quality or reliability.

#### RoHS, REACH, WEEE: What Do They Mean?

**RoHS:** EU Directive 2011/65/EU is designed to limit the use of certain hazardous substances (such as lead) in electrical and electronic equipment. It regulates the use and placing on the market of hazardous substances in electrical devices and electronic components.

Directive 2011/65/EU (RoHS 2) replaced the previous Directive 2002/95/EC (RoHS 1) on January 3, 2013.

Both directives are unofficially abbreviated to RoHS: Restriction of Hazardous Substances.



**REACH:** REACH is a Regulation of the EU (Regulation (EC) No. 1907/2006) which was enacted to improve protection for human health and the environment against risks which may be posed by chemicals and at the same time to improve the competitiveness of the chemical industry in the EU. It also encourages alternative methods to identify the harmful effects of substances to reduce animal testing. The REACH Regulation came into force on June 1, 2007.

REACH stands for Registration, Evaluation, Authorization and Restriction of Chemicals.

**WEEE:** The European WEEE Directive 2012/19/EU (Waste of Electrical and Electronic Equipment) is designed to avoid or reduce negative environmental influences caused by end-of-life electrical and electronic devices and to achieve sustainable production and sustainable use of electrical and electronic devices by reuse, recycling, and other forms of reutilization of such electrical and electronic waste.

Directive 2012/19/EU ("WEEE 2") came into force on August 13, 2004 and had to be implemented in the national law of all EU member countries by February 14, 2014. At the same time, the previous WEEE Directive (Directive 2002/96/EC, "WEEE 1") was withdrawn. The transitional period defined in WEEE Directive 2012/19/EU will come to an end on August 14, 2018 at which time an open field of application will come into force.

### The following changes to diaphragm gas meters are a result of RoHS and REACH:

#### Connectors

The connectors for our diaphragm gas meters have been galvanized and yellow-chromated for many years to ensure good protection from corrosion.

The coatings for the connectors have been changed to meet the specifications of the European REACH Regulation.



We have developed a very good alternative for our diaphragm gas meters. The new modern zinc-nickel coating both complies with the REACH Regulation and meets the corrosion protection requirements of EN 1359.

The new connectors have been used in the production of some meter types since the end of 2017. The change will be completed by the third quarter of 2018.

#### Diaphragm

The core of the diaphragm gas meter, the diaphragm, is also affected. The composition of the diaphragm material will be changed slightly to meet the requirements of the European RoHS Directive.

The quality of the diaphragms will not change. They will also continue to satisfy all the applicable requirements of EN 1359, particularly that of measurement stability.



Diaphragm Gas Meter

Connector

With Zinc-nickel Coated

Since a wide range of meter types and several production sites are affected and also stocks of material at the time of the change must be taken into consideration, this change will take place during the fourth quarter.

Other changes are made to diaphragm gas meters which are not the result of RoHS and REACH:

#### **BK-G25 Housing**

The housing of the BK-G25 has been modified. To reinforce the upper section, four beads have been stamped around the index.

On the old version, during the tightness test using 750 mbar, on some occasions a cracking noise could be heard caused by sudden bulging as the pressure was increased.

This bulging has always been and continues to be insignificant for operational safety but it made the installation of large indexes more difficult. Production of the BK-G25 V12 A335 (two-pipe) was changed in mid-2016.



Diaphragm Meter BK-G25 With Reinforced Upper Housing Section



The material thickness continues to be 1 mm and the metrological properties and dimensions are also unchanged.

#### Index Plate

The index plate on diaphragm gas meters and the printing of the electronic index will undergo various changes.

1) As a result of the integration of Elster GmbH into the Honeywell Group, the manufacturer's logo will be changed on diaphragm gas meters. If it has not already been changed, the Honeywell logo will appear on the index plates in the future. The manufacturer is still Elster GmbH. The type designation, the number of the EU type examination certificate and customer numbers and logos are not affected. The manufacturer's address will also continue to be Elster GmbH. This does not affect gas meters placed on the market on the basis of a parallel approval.



Index Plate Changes Using the Example of the Absolute ENCODER

- 2) For labelling pursuant to the **Welmec Guide 11.4** (briefly: "Marking on gas meters"), the inclusion of a "V" is required to indicate that the volume in operating state is displayed. On converting meters (in other words, diaphragm gas meters with mechanical or electronic temperature compensation), the inclusion of a "V<sub>b</sub>" is required to indicate that the volume at base conditions is displayed. By agreement with PTB, the Notified Body, this "V<sub>b</sub>" will be implemented in the form of "V<sub>tb</sub>" to avoid confusion with the existing "V<sub>b</sub>" label for the operating volume of volume conversion devices.
- 3) Diaphragm gas meters which contain electronic components (for example, diaphragm gas meters with an Absolute ENCODER or with an electronic index) are regulated by the European WEEE Directive. The WEEE symbol (a crossedout wheeled bin) will be introduced on the index plate or the electronic index – if this has not already happened – to indicate the requirement to collect and dispose of electrical and electronic devices separately.
- The black bar on the index plates will be reduced to a simple border to allow the printing change.

We can be accused of many things, but staying still and going backwards are certainly not among them. Diaphragm gas meters from Honeywell Elster are modern, smart and, of course, satisfy all the statutory requirements. And even more ...

If you have any questions about these changes, please do not hesitate to contact Daniela Lücke-Janssen or Hans Arp.

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### **Introducing Measurement IQ for Gas**

Measurement IQ for Gas allows easy health monitoring of your complete metering systems 24/7. Intuitive and easy to use, it enhances the visibility of your high-pressure equipment across the enterprise; you can implement effective preventive maintenance strategies, minimize calibration requirements, and reduce operating expenses.

> Using Honeywell's data center and the Measurement IQ for Gas software, you can transform your metering operation – and your business.

If you have a small error in your primary and/or secondary measurements, you have a big problem. Minor inaccuracies accumulate quickly to erode profits. With tight margins, a broader hydrocarbon mix, and more pipelines with impurities in the gas, you need to keep on top of your equipment health. But you can't be everywhere. Getting detailed diagnostic data and meaningful analyses from meter stations to Maintenance, Operations, and Leadership teams takes time or just doesn't happen – all while losses could be racking up. The big question is: How can you see everything without being everywhere?

Honeywell Connected Plant Measurement IQ for Gas is the answer.





#### **Get Connected**

Using the power of connected technology, we can connect to metering equipment right across the world and monitor it from a single screen. A simple edge device at the site and a web browser are all that's needed. Combine these with Measurement IQ and you can elevate your insight into measurement data across the enterprise, gaining real-time, actionable intelligence.

Connecting to your high-pressure equipment enhances visibility and can transform the maintenance operation with:

- Effective preventive maintenance strategies
- Minimized calibration requirements
- Reduced operating expenses.

Data is captured securely online in Honeywell's data center and shared with users across the business through an intuitive dashboard on their PCs, tablets and even phones. This ensures you get the data to where it's needed to support better decisions. Imagine if engineers could diagnose faults before they got to equipment; if operators and leadership could get real-time alerts when key limits were exceeded; and if you could share and collaborate across the enterprise to harness all the expertise in your organization. With a connected solution, you can.

#### **Cut Costs and Boost Performance**

Measurement IQ for Gas can revolutionize meter servicing. Time-based and risk-based maintenance strategies both result in unnecessary recalibrations or – worse – undetected errors. Measurement IQ's diagnostic dashboard gives users an at-a-glance overview of gas metering stations, and intelligent alarms alert them to problems.

By monitoring not just the flow meter, but also the process and environment around it, Measurement IQ detects significant changes and anticipates problems before they occur. When indicators suggest performance deteriorating or forthcoming equipment failure, it prompts users to act: It lets you focus maintenance on where it's needed.

Using historic diagnostic information, you can also support extensions to calibration intervals specified by regulatory authorities. Extending the calibration interval from one to two years can save a business \$50,000 a year. But detecting errors and preventing mismeasurement could save much more.

Benefits from condition-based monitoring and maintenance are felt across the organization: Fewer visits from engineers, less lost and unaccounted for gas, less downtime, and increased measurement certainty. It's the answer for a more efficient, more reliable, safer operation. And it just shows: If you look after the little things, the big things really will take care of themselves.

To find out more about how connected meter monitoring could enhance your business, visit: <u>http://hwll.co/MeasurementIQ</u>

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## **Smart Energy for Today and Tomorrow**

Referring to the evolution of energy as becoming "smart" or "connected" has often felt like a buzzword. However, businesses are now leveraging new technology to develop critical solutions that improve customer satisfaction and drive business results. The best part: It doesn't have to require a big investment, and it doesn't all have to be done at once.

#### **Road Map to Connected Utility Benefits**

Utilities only need to look at the homes of their customers to see how connected technologies are already solving problems today. Ten years ago, the idea of a connected home was the realm of the super-rich; people that paid tens of thousands of dollars for a professional to wire their home for automation. Today, over 30% of homes have at least one connected home device, including thermostats, cameras, and locks. That number is expected to increase to over 50% by 2022. These devices can be purchased for a few hundred dollars and installed in a few minutes to solve specific problems. Gone are the days of needing a pricey professionally-installed system. Homeowners can just solve the problem that is important to them.

Just like the example of a connected home, utilities can look for solutions to problems that are troubling them today. They don't need full system integration to get real, fast benefits. One example of this is to deploy a workflow tool using Augmented Reality.



Honeywell Intelligent Wearables

#### Augmented Reality and the Gas Utility

Much has been written about issues of skill shortages within the industrial world. According to the World Petroleum Council, the average age of staff in oil and gas companies is 50 years old. When these employees retire, they will take with them decades of knowledge and skills.



So, what are companies to do? How should companies increase immersive competency of skills? How can gas providers maintain optimal efficiency to better distribute gas effectively to the end user?

One technology that has people excited is Augmented Reality. Augmented Reality

Intelligent Wearables Progressing Skill Competency and Generation to Generation Knowledge Transfer



American Meter AC-250

means being able to be present in the world around you, but "augmenting" this by adding visual or auditory clues that help the user get the job done. One example of this, using Microsoft's HoloLens technology, would be looking at a complex machine in front of you and visually seeing an overlay of tooltips and illustrations, highlighting the key elements of the product.

Augmented Reality is just emerging as a business tool, but there are some incredible areas being explored.

- Field protective gear with voice recognition technology can be used for workflow and task management, improving efficiency and transparency while reducing the chances of human error.
- Headsets or tablets with 3-D models of devices can help train employees on the complex inner workings of a product.
- Immersive environments can be used to train workers on complicated or even dangerous procedures, at a fraction of the cost and at no risk to human life.

Honeywell is excited to be working on an Augmented Reality training tool based on the American Meter AC-250. Users will be able to use the Microsoft HoloLens, or just a basic Android or iOS tablet, to view and manipulate a 3-D model of an AC-250. This lets them understand the inner workings of the product, eliminating the need for a bulky "cut-away" model, to give hands-on experience. For users in meter shops, there will be a training module that teaches a user how to adjust the proving accuracy of the meter.

Implementation of this progressive technology is driven by the fact that the next majority segment of workers is Millennials. Considered to be technologically nimble, having grown up in the Internet age, Millennials have deferred to a more experiential working and learning process which is transforming operations.

In-depth immersive skill competency, generation-to-generation knowledge transfer, process insight development, and demand of efficient and effective gas utilization, all pose as critical pillars for the bridging and use of Augmented Reality in gas operations and processes.

#### Bottom Line

This is just one example of why Honeywell Smart Energy is a trusted leader in developing smarter solutions for gas utilities. You are our partner, and we're committed to your business. To us, that means providing you with solutions that go beyond the buzz to solve real challenges now, while ensuring true value for years to come.

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#### Permasert 2.0: Efficiency and Mechanical Couplings

# One Goal – Safe, Efficient, Reliable Gas Delivery

While gas utilities vary in characteristics such as size and scope, a common goal remains: The safe, efficient, and reliable delivery of natural gas to customers. Fortunately, technology developments are providing pathways for all utilities to take advantage of improved efficiencies and insights.

#### Permasert 2.0 – Innovating Performance, Ensuring Reliability

For more than 40 years and 50 million installations, the original Permasert™ couplings have meant safe and reliable gas distribution, but in today's world, utilities' needs are changing. Methods such as horizontal drilling during the installation of gas control and distribution products have led to complications relating to scratched piping. This technique has a tendency to create scratches on the external surface of the pipe, which can make it difficult to achieve a good seal using OD sealing methods.

The new Permasert 2.0, an updated offering by Honeywell Perfection, has taken the established Permasert<sup>™</sup> sealing technology and combined it with an innovative, industry-changing, ID and OD dual seal mechanical design. This solution will provide utilities with the best-in-class protection against nuisance leaks and pipe variations, especially when used with horizontal boring.





"Honeywell Perfection has been a leading provider of safe gas delivery solutions for decades. The Permasert 2.0 product is the latest in a line of innovations that builds upon that legacy," says Jon Smith, General Manager of Gas Americas Honeywell Smart Energy.

Permasert 2.0's innovative design can be installed in virtually any weather conditions and is made to perform in a large variety of installation applications. Permasert 2.0's added inner diameter (ID) seal provides an additional layer of gas-tight protection, even in cases where OD sealing is less than optimal due to pipe scratches or other piping defects.

All Permasert 2.0 configurations will deliver sealing and protection as permanent as a fusion joint, yet installation is much faster, promoting a reduction in installation and material costs. The Permasert 2.0 is also eco-friendly as no power source is needed, thus generating neither noise nor pollution.



#### Safety & Quality

Honeywell Smart Energy's Perfection facility in Geneva, Ohio, has been at the forefront of ensuring that Honeywell customers receive guaranteed performance and sustained quality and reliability of gas distribution solutions. In order to meet the safety and quality demands of customers both now and in the future, Honeywell Perfection employs automation processes that utilize robotics alongside hi-resolution cameras to ensure better built assembly and production of the Permasert 2.0 product line.

The state-of-the-art process translates to increased plant capacity, shortened lead times, and reduced cycle times when paired with Perfection's Express Fulfillment service. The Perfection Express Fulfillment program offers a best-in-class 4 week lead time for the most popular products in its portfolio, and the list will continue to grow over time.



#### Quality and Performance You Can Rely On

For more than 40 years, the Honeywell Perfection brand has had the mission of partnering with utilities in order to learn the challenges of the natural gas field and develop products that bring real value to utilities and help ensure reliable gas delivery.

Kevin Graebel Jonathan Wells kevin.graebel@honeywell.com jonathan.wells@honeywell.com Robotics Camera

## Accurate Online Natural Gas Heating Value Determination

The use of natural gas is abundant all over the world. For transparent custody transfer of natural gas, the determination of the energy content of the transported gas is key. Gas chromatography is the de-facto standard for this kind of measurement.

As the number of gas sources continues to grow, the amount of measuring points increases as well. This calls for affordable solutions to measure natural gas.

With the new EnCal 3000 proChain, Honeywell sets a new standard in gas chromatography for natural gas. It provides accurate determination of all main natural gas parameters – including the heating value, Wobbe index, density, and CO<sub>2</sub> concentration – while keeping CAPEX and OPEX to a minimum. Making everything smaller results in the lowest carrier gas usage in the market. As low as 2.5 milliliters per minute. This means only one bottle of helium (50 liters @ 200 barg) every seven years.



#### **Easy Maintenance**

The optional local display gives the user all the information needed to make a fast decision on the actions required when needed. It shows the concentration data of the natural gas and the status of the analyzer.

The optional local USB port can be used to quickly connect a laptop to run service and/or configuration tools. No need to open the analyzer, which saves time on service.

The single train, single injection C6+ backflush-to-detector configuration enables the analyzer to have a minimum number of moving parts, therefore making it easy to troubleshoot. The measuring channel can be replaced by simply removing two screws. This allows for low downtime in the unusual event that something goes wrong.

#### Sampling System

The integrated sampling system ensures that limited sample conditioning is needed. The EnCal 3000 proChain has a maximum of 6 streams of which minimum one can be addressed as calibration stream. Each stream has an exchangeable inline 2-micron filter that keeps out particles from the analytical part of the analyzer. In addition, the analyzer features a built-in fast loop valve that allows for fast purging of long lines if required. This ensures that a fresh sample comes to the analyzer at the correct time. All this makes the installation of the GC straightforward. The last item needed for a complete installation is a pressure-reducing sample probe with a liquid filter.



#### Installation

The EnCal 3000 proChain is an Ex-d type analyzer, designed for installation in hazardous areas. This makes it possible to install the analyzer near the sampling point and, if necessary, outdoors. With optional heaters, the EnCal 3000 proChain can cope with temperatures down to -25°C (-13°F). Also, hot environments are no issue for this analyzer; up to 55°C (130°F) possible for installations outside. Sun/rain shades are always recommended. Honeywell can also advise and deliver solutions for situations that require going outside of this very broad range.

#### Conclusion

The gas chromatograph that will measure your natural gas according to the latest standards, while keeping both CAPEX and OPEX to a minimum, will be the next best thing – the proChain.

Hans-Peter Smid hans-peter.smid@honeywell.com

#### Honeywell Smart Energy:

# Best-in-Class Metering Solutions and Communication Technology

At first glance, they are only meters. However, a closer look shows that Honeywell has completely aligned its entire portfolio of diaphragm gas meters to the new requirements of AMR technologies. Unique in the industry, it is possible to integrate the entire range of diaphragm gas meters into AMR systems. With a measuring range of 1:10,000 across the entire portfolio, all low-pressure applications are covered.

> You have a choice. For the roll-out of smart meters, we offer both fully integrated solutions for various communication technologies and modular solutions.



The advantages of integrated solutions are obvious, especially when considering the entire product life cycle (Total Cost of Ownership). Our smart meters measure the cumulated volume via a Hall sensor directly at the meter. No pulses, no local parameterization, no deviations between meter and add-on devices. An "Easy Installation" screen on the meter display simplifies the installation of the meters many times over and requires no special knowledge; parameterization in the field is no longer necessary. The handling and logistics of different devices point and in the selection of communication technology, as well as battery-free metrological components.

Data protection and data security deserve special attention. Our solutions take this fact into account. The communications protocols used are transmitted in encrypted form, different roles on the meter (e.g., installation, service, battery replacement) are performed via role-based authorization and prevent both errors and misuse. Bidirectional communica-

#### Honeywell Smart Energy - Gas Portfolio at a Glance





are eliminated and the space requirement of an integrated meter is smaller than that of a meter with add-on devices. Special attention was paid during the development to make installation – even in large quantities – as efficient as possible.

Modular solutions, on the other hand, enable the integration of existing meters into communication systems, flexibility at the metering tions solutions offer the possibility of firmware updates.

In addition to the development of new technologies in and on the meter, Honeywell also offers efficient systems for meter data collection. This development was indeed a logical consequence, because who knows better about the "needs" of battery-powered devices than the manufacturers of such devices.

Carsten Lorenz carsten.lorenz@honeywell.com

## Honeywell ER 350 Pressure Recorder

Local gas distribution and transmission companies utilize electronic pressure recorders to monitor pressure in the gas distribution and transmission grid. Electronic pressure recorders are a key element in the gas value chain, contributing to the security and availability of gas within the gas distribution network.

> Honeywell's ER 350 electronic pressure recorders are intended to simplify and optimize pressure monitoring applications. This new pressure recorder, based on the EC 350 electronic corrector platform, offers best-in-class accuracy, expanded memory, advanced diagnostics, and integrated cellular communications. The ER 350 also reduces maintenance requirements and is intuitive and simple to use.

> Honeywell's ER 350 exploits the improvements brought to the correctors product line and reuses the same platform as the EC 350, and therefore brings similar advantages:

- Intuitive operation for all pressure-recording applications
- Versatile wall and pipe mount options
- Supports Cloud Link 4G cellular modem
- IR port allowing for easy configuration
- Advanced audit trail
- Robust diagnostics to reduce maintenance
- Extended 10-year lithium battery life





- Low ownership and operating costs
- Multiple audit trail loggers enabling fast and slow logging

The ER 350 series provides many operational advantages. These flexible devices have a common look and feel, and utilize state-of-the art technology, such as a 4G modem. They also incorporate a highly accurate, plug-and-play digital pressure transducer and an enclosure optimized for serviceability. Featuring long-term stability and extended battery life, the ER 350 minimizes the need for site visits and simplifies field repairs.

Best of all, the ER 350 utilizes the same user interface as our field-proven EC 350. It also uses a robust latching and locking mechanism, similar to the ERX standard for ruggedness and reliability.

Pierre Dufour

### **Subwoofer Becomes Fire Extinguisher**

For several years now, Elster-Honeywell has been involved in the "Jugend forscht" science and technology competition. Once again this year, we were represented at state level in Rhineland-Palatinate on the jury for the Technology section.



You can take a look at the invention using the follow-ing link:

https://1drv.ms/f/s! Ar\_QEQF5JvLAiSki7O RA0rXXUWIa In addition to the written submission, the presentation and answering the questions posed by the jury are extremely important in the assessment of the projects. This year, we were persuaded to award the prize to a young team from Neustadt an der Weinstraße. Jonas Mannweiler, Philipp Salm and Gabriel-Marius Hartmann submitted a prototype of an extractor hood with an automatic fire-fighting device<sup>1</sup>.



Courtesy: BASF; Jonas Mannweiler, Philipp Salm, Gabriel-Marius Hartmann (from left to right)

The majority of household fires start in the immediate vicinity of a range. If these fires are extinguished using conventional fire extinguishers, there is also the fact that the powder requires a great amount of cleaning work. The team therefore considered how minor fires could be extinguished quickly and efficiently without causing additional damage.

 Range hood with fire-fighting function Jonas Mannweiler (14 years old), Philipp Salm (14 years old), Gabriel-Marius Hartmann (16 years old) Jugend forscht AG Neustadt/Weinstraße 2017/2018 – March 29, 2018

2 Toy, tank with elastic fabric membrane

When playing with an Airzooka<sup>2</sup>, they quickly realized that powerful air movements could actually extinguish a small fire. Additional experiments and research proved that there is a patent in the USA which describes the disruptive effect of sound waves on fire.

The team pursued this approach and developed a range hood with a fire-fighting device using a subwoofer as a sound source. In an extensive range of experiments, they discovered that a frequency of 8 Hz with a sound pressure of 12 dB was ideal for extinguishing small fires. A light sensor (lightwave range 760 to 1000 nm) is used to detect a fire. This is designed to ensure that the subwoofer is only triggered if there actually is a fire and does not react to the heat of the burner or to vapor.

The team also developed the entire control unit and completed the metalworking required for the invention. With their excellent presentation, the young researchers verified that their invention worked perfectly using candles and fire gel. In other words, they converted a subwoofer into a fire extinguisher and earned themselves first prize in the Technology section of the competition.

Feeling intrigued? Further information can be found at <u>www.jugendforscht.de</u>

Rüdiger Pfeil

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#### Key Element in Value Chain:

## Cloud Link 4G Modem Updated With New Low Power Cat M1 Radio

The natural gas industry presents complex challenges. Companies must find ways to operate more safely, make better decisions and act more quickly by more efficiently delivering crucial asset data from operations to enterprise.

The specific demands on gas utilities include:

- Higher operating costs impacting business performance and profits
- Increased risk to assets posing threats to operational reliability and uptime
- Time-consuming data collection making it difficult to determine asset health
- Technology obsolescence limiting efficiency and productivity improvements

The cellular modem is a key element in this value chain. Honeywell is introducing the Cloud Link 4G modem with Cat M1 technology support. The Cloud Link 4G modem is fully integrated with the EC 350 volume corrector and the MiWireless platform, it is entirely field-programmable and simple to use thanks to its short-range wireless communication or serial interfaces, and associated set of programming software.

#### Low Power

Most applications encountered in the world of gas distribution are battery-operated. Power can come from solar panels or simply be provided by batteries. The Cloud Link 4G modem was designed with this concern in mind in order to provide the longest battery life possible.

#### **Hazardous Locations**

Safety of the applications is a concern for all gas distribution companies and being able to install products that support this need is critical. To ensure installation is simple, the Cloud Link 4G modem was designed to meet the specifications for the most stringent Class 1 Div 2 and even Class 1 Div 1 applications.

Feature	Benefit
• 80% lower idle current than Cat 3 based (current) radios	• 50% to 300% increased battery life
<ul> <li>30% lower transmit current than Cat 3 based (current) radios</li> </ul>	<ul> <li>Decrease in the number of truck rolls required to change batteries</li> </ul>
	<ul> <li>Increase in the availability of the modem</li> </ul>
• +18 dB link margin gain	Better operation in basements
	<ul> <li>Increased open space performance (distance to cellular tower multiplied by 4)</li> </ul>
<ul> <li>Class 1 Div 1 / IEC Ex zone 0 certified</li> </ul>	Safer and easier to deploy

#### New Features and Benefits of the Cat M1 Radio





The Cloud Link 4G Modem with Cat M1 Technology Support

#### **Extended Temperature Range**

Outdoor applications can be challenging at times with temperatures getting extreme. To ensure it perfectly functions in the most demanding conditions, the Cloud Link's operating temperature range has been extended to support -40°C to +70°C in Class 1 Div 2 installations and -40°C to +65°C in Class 1 Div 1 installations.

#### **Easy to Configure**

The Cloud Link 4G modem can be configured through the innovative MasterLink app (available on Android or iOS platforms) or PC software. Configuration can be done completely wirelessly either using its short-range Bluetooth Low Energy BLE) interface, or over the cellular wireless network. The RS232/485 communication port can also be used to do the configuration. When connecting to the modem, the MasterLink app will perform diagnostics and display the relevant information on the cellular network. The app can also be used to do a site survey to ensure the cellular coverage at the location is suitable for the modem. The site survey can be stored, baselined, and used later to troubleshoot communication issues.

With the right choice of instrumentation, software, and the supporting ecosystem, utilities supplying natural gas can minimize their downtime, generate more return on installed assets, leverage current industry trends, and prepare their operations for a challenging future. The Cloud Link 4G modem is a key element of this value chain.

Pierre Dufour pierre.dufour@honeywell.com

#### Please visit us on our upcoming events and fairs:

#### World Gas Conference 2018

June 25-29, Walter E. Washington Convention Center, Exhibition stand 1703 Washington DC, USA

#### International North Sea Flow Measurement Workshop 2018 October 22 - 24, Ardoe House Hotel Aberdeen, Scotland

#### Gas Meter with NB-IoT:

### **Connected and Smarter**

Honeywell has recently developed an NB-IoT residential gas meter for the Chinese market that has successfully passed both laboratory and field tests. This meter is using the latest NB-IoT communication standard as deployed by the major Chinese telecom operators China Mobile and China Unicom.

> We are ready to provide smart gas meters with NB-IoT features to our utility customers and partners. Today, gas energy is becoming more and more critical. According to the latest report from the IEA, global gas demand is expected to grow by 1.6% a year for the next few years, with consumption reaching almost 4,000 billion cubic meters (bcm) by 2022, up from 3,630 bcm in 2016. Demand relating to the new gasification is the main driving force behind this gas consumption growth. Therefore, global gas meters are also experiencing very steady growth of 3.1% CAGR for shipments, of which smart gas meters with communication options amount to over 10% CAGR (IHS report).

Among many different gas meter communication technologies available, the Narrowband Internet of Things (NB-IoT) has been one of the best choices until now. NB-IoT is a standards-based low power wide area (LPWA) technology developed to enable a wide range of new IoT devices and services. Supported by all major mobile equipment, chipset, and module manufacturers, NB-IoT can co-exist with 2G, 3G, and 4G mobile networks. Honeywell developed the NB-IoT residential gas meter based on the robust, mature Honeywell Elster diaphragm gas meter. After testing, several benefits of NB-IoT communication for gas meters were proven.

- Network security reliability: NB-IoT is a network based on a licensed spectrum. It has high security guarantees in terms of anti-jamming capability, data security, and technical services, and is easy to promote.
- 2. Low power consumption: NB-IoT is characterized by low power consumption. Taking the NB-IoT gas meter currently being developed as an example, its built-in battery could be used for normal operation of a watch for more than 8 years.
- 3. Network coverage with large capacity: NB-IoT boasts wide and deep coverage, which can solve the complex problems of the gas meter installation environment. NB-IoT has a large capacity to enable the simultaneous access of massive devices.
- 4. Standard 5AA battery and easy change: The NB-IoT smart module uses three 5AA batteries and is easy to change when the batteries run out.
- 5. Easy to upgrade existing gas meters: The module can be added to the existing diaphragm meter.

We also design and test more smart features like anti-tamper alarm, low battery alarm, network signal monitoring, valve control & so on. It will be a real evolution to connected and smarter technologies for gas metering.

Rex Zhang

#### **Total Care Field Instrumentation Services**

### **Protecting Your Gas Metering Investments**

As the gas industry environment becomes increasingly automated and complex, operating companies often focus their investments on improving their skills in the use of new technologies. But the importance of asset health monitoring and maintenance should not be overlooked.

Honeywell's Total Care Field Instrumentation Services for Elster products address the operational and business demands that gas firms face every day. Maintenance outsourcing and preventive maintenance strategies can provide relief from these challenges and improve the bottom line by optimizing safety, efficiency, reliability, and uptime. They can also ensure continuity in gas measuring processes.

Now, more than ever, there is a need to leverage investments in control systems, field devices, and data infrastructures. Changing markets, regulatory issues, and complex supply chains require accurate, reliable measurements across operations.

Measurement and control equipment is central to a safe and profitable business, and a potential critical point of failure. As the burden on these systems grows, so does the strain on people and processes supporting them.

Gas industry firms must address their entire operations from a business perspective to maximize return on capital expenditures. Undetected errors in measurement resulting in lost or unaccounted for gas can quickly erode profits, and the same goes for unplanned downtime.

#### **Optimizing Asset Performance**

As a leading global supplier of controls and instrumentation, Honeywell Process Solutions offers its Total Care Field Instrumentation Services for Elster products to help customers streamline start-ups and optimize their control



system and instrumentation infrastructure. Honeywell's solution provides personalized service and assistance throughout the life of automation assets.

Total Care Field Instrumentation Services for Elster products are backed by in-depth experience to support a wide range of metering equipment. Elster's smart meters, software and data analysis solutions for commercial, industrial, and residential applications are recognized for their reliability, safety, and accuracy. In the gas, electricity, and water industries, they provide the capabilities and confidence needed for successful operations.

The goal of our Total Care Field Instrumentation Services is to stop operational problems from evolving into serious incidents or disasters. There is never a good time for vital equipment or instru-



ments to fail. But with aging systems, increased complexity, and regulatory pressures, failure to get the right support can mean a fault is just the start of a problem.

Total Care Field Instrumentation Services address the primary threats to a facility's dayto-day safety, availability, and productivity. The comprehensive services portfolio is intended to reduce the likelihood of failures, shorten recovery times, and eliminate skills and knowledge gaps.

All our Total Care Field Instrumentation Services for Elster products are linked with one another in order to reduce problems that keep operations from performing at peak levels by:

- Reducing the probability of trouble through regular maintenance; managed software updates and security; and planned, structured migrations;
- Minimizing downtime when problems occur through access to readily available parts, on-call service, and remote connectivity for troubleshooting and repairs;
- Closing gaps in internal expertise with 24/7 assistance, access to safety and regulatory compliance experts, and tailored training programs.

Total Care Field Instrumentation Services for Elster products offer a global, common, and simple framework that helps operating sites transition from reactive maintenance to a more effective, planned, and profitable solution – avoiding surprises and unexpected expenditures. In particular, the services eliminate run-to-failure costs of repair and replacement.

#### Specific service deliverables include:

**Site Survey:** A comprehensive site survey provides an inventory of existing equipment, recommended instrumentation, and an evaluation of internal obstructions and external observations. It can also determine whether additional maintenance or repair will be necessary to help establish a preventive maintenance budget.

**Product and System Integration:** Service professionals provide integration and communication between other products and systems. They utilize the customer's scope of work definition and a detailed explanation of their desired operation.

**Remote Monitoring:** Instead of waiting for problems to occur, why not rely on experts to continuously monitor the condition of equipment, and collect accurate and reliable information? This helps to minimize support calls, reduces the number of unscheduled or unnecessary service visits, and increases uptime to further enhance productivity.

**Device Diagnostics:** In-situ flow meter verification determines actual meter performance in operation. Data collected on site and analyzed at the factory determines meter and installation conditions. The analyses can detect misreading



due to installation effects and equipment damage, and forecast accuracy at minimum flow.

Verification and Validation: Services are offered to keep gas measurement devices in the best working order. Checking all equipment for the required accuracy protects businesses from costly measurement errors. Verification tests are tailored to specified tolerances to meet all necessary industry standards and contractual agreements.

**Commissioning:** Technicians provide the assurance that equipment installation is done correctly and perform a final inspection to mitigate the risk of any potential problems.

**Calibration:** End users in Belgium and The Netherlands can minimize process shutdowns with on-site check-ups and calibration of rotary and turbine meters. Eliminating the need to send equipment back to the factory, this solution can help reduce the costs of checking, calibrating and, where appropriate, repairing equipment. For other countries, calibrations can be carried out at our on-site certified calibration labs.

**Training:** Results-driven training – whether in-house or on-site – improves productivity, with instruction tailored to cover operation, commissioning, and maintenance.

#### **Enhancing Maintenance Strategies**

Honeywell's Total Care Field Instrumentation Services for Elster products look at the entire gas metering equipment lifecycle from a service perspective. The services employ the versatile Measurement IQ for GAS system to optimize condition-based maintenance (CBM) in order to avoid any misreading or asset failures, and identify potential problems in advance.

Gas industry companies can use Measurement IQ for Gas to evaluate the health and performance of critical metering equipment, and then take the appropriate steps to optimize its service longevity and overall lifecycle results. Users are able to implement effective preventive maintenance strategies and minimize instrument calibration requirements in order to reduce operating expenses. Thanks to the Measurement IQ for Gas solution, the condition of gas metering systems can now be monitored continuously by gathering relevant data that is available at the primary and secondary measuring devices in the field. The system automates 24/7 condition-based monitoring, detects problems before they occur, and helps to keep measurement uncertainty as low as possible.

Measurement IQ for Gas allows for easy health monitoring of a complete metering system. Its powerful condition-based monitoring capabilities detect any significant change either in the flow meter itself, or in the process and environment in which it is operating.

When traditional time-based maintenance (TBM) is used, measuring instruments are calibrated at regular intervals, whether they need it or not. If a risk-based maintenance (RBM) method is applied, the calibration frequency is reduced after a satisfactory level of stability has been demonstrated. By contrast, with CBM, maintenance is only performed after one or more indicators show that the equipment is going to fail soon or that its performance is deteriorating – thus, service and repair are only carried out when needed.

With TBM and RBM, meters are calibrated even when nothing is wrong. Historical diagnostic information provided by Measurement IQ for Gas can be used as a basis to extend the calibration intervals specified by regulatory authorities. This, in turn, may result in a shift from a regime of "calendar-based" off-site calibration to off-site calibration "as required".

#### Value to Gas Industry Customers

Honeywell's Total Care Field Instrumentation Services for Elster products can help gas industry organizations of all types and sizes achieve their business objectives, reduce or contain operating and service costs, and keep metering assets running at peak levels of performance.

Knowledgeable and well-equipped support teams deliver proven, in-depth domain and product expertise. They provide the right solution for faster resolution of critical issues. Key benefits include:



**Improved Safety:** Total Care Field Instrumentation Services for Elster products help customers work with dangerous processes or environments. As essential measurement and control functions as well as the measured data are safeguarded and thanks to customer-oriented support for solving technical and operational issues, these services make safe operations possible.

Increased Reliability: Honeywell's services optimize the health of equipment assets to reduce incidents. They help prevent unexpected downtime and get equipment back up and running quicker when faults occur. Ensuring the right working conditions for a profitable business, this solution helps maximize uptime and minimize the cost of failures.

**Greater Efficiency:** The Total Care Field Instrumentation Services offering safeguards the precision, traceability, and quality control that determine business success. Thanks to their expertise in custody transfer applications where small errors can have a big impact, Honeywell service specialists can keep operations running efficiently, while keeping maintenance costs controlled.

With Honeywell's Elster products, customers have access to advanced technology for highaccuracy custody transfer and high-reliability gas pressure regulation. These solutions not only set the standard for accuracy and reliability, but thanks to a world-class organization delivering superior Total Care Field Instrumentation Services, they also provide an excellent lifecycle experience.

Key to an effective service solution is Honeywell's CBM system, Measurement IQ for Gas, which fully integrates Honeywell's high-pressure products (such as ultrasonic meters, flow computers and gas chromatographs) and takes performance to the next level. Measurement IQ for Gas enables gas operators to implement effective preventive maintenance strategies and minimize instrument calibration requirements in order to reduce their operating expenses.

Louis Oquendo

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#### FORCE Technology

# The World's Largest Closed Loop

The technology behind the high-pressure calibration system at FORCE Technology is unique in the world. It is built as a closed loop with low pressure loss, allowing calibration at maximum pressure and flow all year round, irrespective of the season. It is known as the world's largest closed loop.

> In the small city of Vejen in southern Denmark lies the world's largest closed loop for highpressure calibration of natural gas meters. Since its opening in 2015, industrial gas meters from as far as Australia, Qatar, Brazil, Malaysia, and basically the whole of Europe and the USA have been calibrated on the loop on a 24/7 basis.

#### Unique Technology in High Demand

The unique technology of the loop is the key element to the world-wide demand for highpressure calibration services in Vejen.

The closed loop construction allows natural gas to circulate under a pressure that varies between atmospheric conditions and up to 65 bar, and a flow range from 10 m<sup>3</sup>/h to 32,000 m<sup>3</sup>/h.

The loop is connected to a natural gas transmission pipeline and a distribution pipeline, which allow the fast supply and discharge of gas. The gas is then circulated within the loop by a large high-pressure fan. The connection to the gas grid makes it possible to change the calibration pressure from high to low and vice versa within one hour.

The large pipelines and adjustable strings bring the meter section to a length of 25 meters, and thus as close to a realistic customer pipeline construction as possible in a laboratory.



The world's largest closed loop in Vejen, Denmark, allows natural gas to circulate under a pressure that varies between atmospheric conditions and up to 65 bar.



Jesper Busk has been on board the development of the loop since the beginning of the 1990s.

This construction ensures low pressure loss and stable calibration conditions 24/7 all year round, which benefits customers all over the world.

#### 25 Years From Initial Idea to Unique Solution

The loop has been long underway, and Head of Department of Oil & Gas Flow at FORCE Technology, Jesper Busk, has been on board from the start:

"The idea of the closed loop appeared in the 1980s when we first considered how turbine gas meters behaved under various static pressures. In 1992, we finished our first semi-closed loop, which could calibrate turbine gas meters at 8 bar and with a flow of 1000 m<sup>3</sup>/h dry air," says Jesper.

At the time, there were several high-pressure facilities in Europe, but the idea of a large facility with natural gas as the test medium grew on Jesper and his team.

"Around 2001, we began the design of a closed loop where a high-pressure fan could circulate the gas. But it was impossible to find a fan that could operate within the pressure and flow range we wanted. Many believed it was impossible. So, in 2003, we decided to build it ourselves," Jesper remembers. It took another 11 years, several expansions and many investments before the technology was finalized. The world's largest loop was put into operation in December 2014 under the accreditation of the Danish Accreditation Fund, DANAK.

### High-pressure Calibration Puts Vejen on the World Map

With the loop, FORCE Technology was admitted to the EuReGa, the European cooperation for the realization of the "Harmonized European Reference Value for Gas Metering," alongside industry leaders PTB, VSL and LNE France.

Today, FORCE Technology is working at primary level, generating traceability by developing the European natural gas cubic meter.

"Today, we have no less than 11 accredited calibration facilities. By generating traceability, we ensure our customers the lowest possible level of uncertainty when calibrating natural gas meters," says Jesper, and continues "I believe it is one of the main reasons why we can keep attracting customers such as Honeywell and have them send meters from all over the world to Denmark."

Learn more about the world's largest loop at forcetechnology.com/highpressure

Jesper Busk Ana Petrina jrb@force.dk apt@force.dk

## You Will Meet Us Soon ...

Honeywell, as an organization, is constantly evolving to better serve our customers' needs. This means that experienced managers take on new roles and responsibilities while other experts from both inside and outside the company fill the newly vacated positions. The result is a constant influx of new ideas and viewpoints that help us improve every day. Two of these new experts recently joined the global marketing team for gas.

> Both new Global Product Marketing Managers are on an extensive global tour to meet and talk to you – our customers – face to face, so you can expect to see them soon – either on customer training courses, at Honeywell User Group meetings or at global events like the World Gas Conference in Washington D.C. in June of this year.

Max Gutberlet max.gutberlet@honeywell.com





#### Global Product Marketing Manager High Pressure – Bernhard Thomas

Since February 1, Bernhard Thomas has occupied the position of Global Product Marketing Manager High Pressure. In this role, he oversees the full transmission product line encompassing ultrasonic meters, gas chromatographs, and flow computers at Honeywell.

Bernhard is a long-time Honeywell employee and has recently been responsible for electronic development within the Gas R&D department. Before working in this development-focused role, he gathered extensive experience in customerfacing project management as well. As he was responsible for the electronic part of many of the products that he now manages, his technical knowledge is second to none and Honeywell will greatly benefit from his leadership as we migrate to a 100% Connected Gas portfolio.

> Bernhard is a native German and is based in our Global Gas Center of Excellence in Mainz-Kastel, Germany.

nax



#### Global Product Marketing Manager Distribution – Nelson Silva

Since April 1, Nelson Silva has filled the position of Global Product Marketing Manager Distribution. In his new role, he will oversee the full distribution product line encompassing rotaries, turbines, volume converters, and data loggers.

Nelson joins Honeywell from SICK's Sensing and Automation group where he held the position of Product Marketing Manager for the Industrial Safety Light Beams products. He brings with him seven years of product marketing experience in industry as well as hands-on experience in the automotive, chemical and F&B sectors.

Of Portuguese origin, but raised and educated in Germany, Nelson speaks five languages fluently and will thus help Honeywell better understand our global customer needs without

> anything being "lost in translation." Nelson is also based in our Global Gas Center of Excellence in Mainz-Kastel, Germany.

# Honeywell MasterLink R510

Honeywell's MasterLink is an integrated software solution that works across the entire gas portfolio. It provides a single software package to configure, calibrate, and access data from the gas volume corrector and configure the cellular modem.

The software's intuitive dashboard enables users to quickly determine the overall health status of the instrument. Employing standardized terminology, it is easy to configure and calibrate instruments, import data, and generate reports and graphs – eliminating time-consuming manual effort.

Earlier this year, the MasterLink software was updated to support the entire Mercury Instruments offering (from the latest EC 350 corrector, ERX 350 pressure recorder or CNI4 data logger to the legacy Mini-Max, Mini-AT, ERX, Turbo Monitor/Prover/Corrector products) making it the configuration tool of choice for the Mercury Instruments offering.

This summer, MasterLink is being further enhanced with innovative new services.

#### **Receive Efficient Remote Technical Support**

Have you ever looked at a radio which would not connect to the cellular network and wished you had an expert at your side? Through MasterLink, our Technical Assistance Center can help you troubleshoot your application. MasterLink now allows the real-time sharing of relevant information such as item files, diagnostic information, photos, and videos with our TAC Center, greatly improving the effectiveness of the call.

### View the Status and Alarms of Your Installed Base on a Map

While out in the field, you can now access a map showing the status of the instruments around

you. If an instrument is on alarm, alarm information is available and you are able to act. Zoom in and out of the map and click on the instrument to obtain live information on a specific instrument.

### Manage Your Installed Base and Collaborate With Other Field Technicians

The GPS coordinates and site pictures attached to a specific instrument are stored in a database



and can be shared among different technicians. A technician is on vacation and you need to service an instrument you have never been to? The MasterLink mobile app will obtain the information from the database and help you get there and locate the instrument faster.

With the right choice of gas volume corrector software and the supporting ecosystem, utilities supplying natural gas can increase their productivity, lower operating expenses and achieve more value from investments. By becoming an early adopter of innovative solutions like MasterLink, they can also minimize their downtime, generate more return on installed assets,

leverage current industry trends, and prepare their operations for a challenging future.

Pierre Dufour

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### Please Don't Leave Us!

Do you live in Europe? If you answered that question with "yes," you share my pain. Your professional and private inbox has been overflowing with e-mails alerting you to changes in privacy policies and asking you to reconfirm your e-mail addresses – just yesterday I received 45 of these! The topic at hand is called GDPR.

If you answered the above question with "no," you are not out of the woods, because GDPR will affect you, too.

What does the acronym mean? GDPR stands for General Data Protection Regulation, a new set of rules to protect your private data that became effective on May 25 of this year. Penned fundamentally by my fellow Germans who for historic reasons are very sensitive when it comes to data privacy, the GDPR brings personal data protection to a new level. And for the first time, companies that do NOT comply with the regulation can be heavily fined – up to 5% of their annual turnover!

At Honeywell, safety and security form the core of our business. If you have ever been to a Honeywell presentation, you know that EVERY presentation starts with a safety minute. This obviously encompasses both physical space and virtual space as well as the privacy and security of our customer data, which has been our number 1 priority for years – there is good reason to believe that Honeywell runs one of the largest Cyber Security teams in the industry.

Honeywell has been adhering to the strict German data privacy laws in its European locations for decades, so moving this to the GDPR regulation was not really a challenge. But Honeywell decided to go one step further and make the GDPR rules mandatory for ALL its operations around the world – no matter whether they process or



store EU customer data or not. A step that is mirrored by almost every single Fortune 100 company in the world. Because superior data privacy makes sense wherever you are, not only for the EU27. One of the side effects of the new rules coming into effect is that we need to ask you once again for your permission to send information. Many of you will find this ridiculous, as you have been dealing with us for decades, in some cases centuries, but the rules on this are clear – we need to get your explicit approval AGAIN. If you have been receiving our regular updates on product features, training courses, service, and pricing, you will have received an e-mail in the last couple of days asking you to please reconfirm your permission to send you communications. If you have received this and have clicked on the link to reconfirm, thank you for placing your trust in us.

If you did not receive the e-mail or if it got lost in the other 60 e-mails asking you for the same thing, please go to the URL below to reconfirm your subscription:

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Because by reading these lines in the Profiles magazine, you are telling me that you are at least interested in some things that we want to share with you – and it would be a great pity if we could not continue to do so, as receiving feedback from you – our customers – is the best way for Honeywell to improve and to continue to exceed your expectations. So please, don't leave us, and allow us to stay in touch with you.

Max Gutberlet

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Gudrun Biedermann gudrun.biedermann@honeywell.com

#### WGC 2018

### Honeywell at the World Gas Conference

In 2018, the World Gas Conference is coming home – at least for Honeywell. The World Gas Conference is arguably the biggest and most important global event for the gas industry.



Held every three years on a different continent, the conference will come to Washington D.C. this year with more than 12,000 visitors from more than 100 countries across the world expected.

Naturally, Honeywell will be at the World Gas Conference in force. Located at Booth 1703, directly off the main WGC walkway, Honeywell will showcase the complete Gas solutions portfolio. Our special focus this year will be on Connected Gas ranging from new communication modems and technologies (we actually have a world premiere at WGC this year) to our new cloudbased Honeywell Connected Plant Asset Performance Insight and Experion Elevate platforms.



#### 27th WORLD GAS CONFERENCE

Honeywell/ Booth 1703 C/O Freeman Walter E Washington Convention Center 801 Mount Vernon Place NW Washington, D.C. 20001

Put on our Virtual Reality glasses and try your skills at servicing a Honeywell ultrasonic meter in the virtual world or see for yourself how we detect and can preemptively react to a sadly common issue in the high-pressure transmission environment – the dreaded dirty gas particles – through Honeywell's new Measurement IQ solution.

Honeywell will also be hosting an offsite customer and partner event at our Washington D.C. office – come join us for some drinks and some discussions on where YOU think the industry is heading and what we need in order to get there.

We are looking forward to seeing you at the World Gas Conference from June 25 to 29 in Washington D.C. – you will find Honeywell at Booth 1703.

Max Gutberlet

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### **EYSCO Measuring Up at MLGW for Honeywell**

The dictionary meanings of "Measured" and "Measurement" show the context and close relationship between the two words, thus "EYSCO Measuring Up at MLGW for Honeywell!". Accurate measurement through a measured process is essential for success!

**"MEASURED"** – (adj) Methodical, deliberate, regular, steady, even, rhythmic, rhythmical, unfaltering, restrained, thoughtful, careful, studied, calculated, planned, considered ...

**"MEASUREMENT"** – (noun) Quantification, qualifying, computation, calculation, mensuration on size, dimension, proportions, magnitude, amplitude ...

US natural gas utilities measurement departments and their personnel are "measured," which is a very appropriate word to describe the natural gas industry, as the consequences of not being "measured" can be costly in many ways! EYSCO's background with Memphis Light, Gas and Water (in short: MLGW) began forty-two (42) years ago in 1975. It started at Mercury Instruments, with American Meter Company (AMCO) then joining them twenty-two (22) years ago in 1996. Mercury Instruments and American Meter are now both members of the Honeywell Group.

EYSCO is "measured" – so our approach was to methodically, deliberately, and continually assess and develop a strategic approach. The key was developing rapport, confidence, and a solid relationship, particularly with influential MLGW executives, rather than those that had used only competitors for decades. Building this solid foundation is a lengthy process, but for "measured" US natural gas utilities and their personnel, it is a requirement to gain assurances that the product provider is honest, capable, and committed. These "foundation years" brought significant Left to right: Mike Javon, Account Manager; Jaye Soss, Vice President; Bradley Utz, Account Manager, and Ed Young.

rewards to Honeywell past and present with the 2014 awarding of the AMR/Meter/Telemetry change-out project.

It is extremely important to acknowledge that EYSCO's success is due to the EYSCO team. For MLGW, this team includes Mike Chitwood – EYSCO Account Manager for MLGW. His countless hours of attention and commitment over many years to MLGW and the relationship, bond, confidence, and respect MLGW has for Mike, were immeasurable for the success and rewards that Honeywell has enjoyed at MLGW! Also, one cannot underestimate the contributions of Jaye Soss – EYSCO VP, who ensured that all the countless elements and details that come with a project of the scope of MLGW are managed and attended to, for MLGW and for Honeywell.

As Honeywell legacy entities, Mercury Instruments and American Meter had little engagement and were virtually non-existent at MLGW prior to working with EYSCO in 1996. For decades, two competitors had all the measurement (mechanical meters and electronic measurement) business at MGLW, as both companies felt it too long a road to travel, particularly for a "Muni".

After four (4) years – 1996 to 2001 – of startup and reengagement effort at MLGW, EYSCO began to make inroads in 2001, but there was still a long way to go.

MLGW's confidence in and reliance on EYSCO meant that EYSCO was supported by MLGW in



the process as the representatives for Honeywell. This resulted in Mercury Instruments and AMCO being selected as the "preferred" measurement equipment providers. The milestones listed were critical foundation blocks for the success of the Honeywell AMR/Meter change-out project well before the 2012-2018 MLGW AMR project.

### MILESTONE: 9/12/2002 – MLGW ordered 1st RPM meter delivered on 10/14/2002.

MLGW measurement personnel were (and are) very "measured" and extremely proficient, so with their major measurement system re-evaluation in 2008, to their credit, they sought to work with trusted allies. As this was a major due diligence undertaking, they considered numerous criteria for selecting their future comprehensive measurement re-vitalization requirements.

#### MILESTONE: 4/12/2008 – MLGW Meter Specifications to SOLE SOURCE "Preferred Source Full Service" meters – AMCO.

While EYSCO positioned AMCO meters and regulators at the customer, they were also on a similar course with Mercury Instruments products. But here, the focus was on the aging and inefficient (sole source) competitor electronic measurement which MLGW had used for decades. This was a significant undertaking for MLGW for many reasons – not only the cost of replacing existing units but expanding their platform.

MILESTONE: 12/20/2008 – MLGW selects EYSCO / Mercury over existing competitors and begins purchasing what will be a total of six hundred (600) EVC

#### and two hundred (200) EPR over four (4) years.

For years, MLGW utilized their meter shop and a local meter service contractor to refurbish aged meters, as was common for many natural gas utilities. While this was once considered an economical, efficient, and effective use of resources, there was an increased cost of refurbishment. That, and the recognition of TCO on new AMCO meters, led MLGW to conclude that the best use of resources was to exclusively procure all new meters from AMCO, not only for aged meter change-out, but for all new installations.

#### MILESTONE: 1/1/2009 – meter change-out program begins, doubled annual usage from 4000 to 8000 meters with annual bid won by EYSCO / AMCO. In addition to this conversion, in 2006 EYSCO had begun presenting the analytics on the values of temperature compensation to capture lost revenue to MLGW. MLGW accepted the values of temperature compensation upon completion of their analysis.

### MILESTONE: 3/1/2009 – three (3) year field test comparison TC vs Non-TC to capture lost revenue.

2009 saw the meter change-out program and with meter change-out, the new meter installation program, and TC acceptance in place, MLGW extended these programs for system growth and renewal.

#### MILESTONE: 1/1/2011 – MLGW changed from annual bid to multi-year bid for 14,000 meters annually from EYSCO / AMCO.

In addition to having all meters from AMCO, MLGW's "preferred" regulator was also manufactured by AMCO and these were in similar quantities as for the meters.

In regard to AMR, for background, it must be noted that MLGW had considered AMR previously. EYSCO, the Honeywell Elster Solutions and AMCO representative, presented AMR to MLGW in 2010. However, they selected another supplier for this limited trial, as Honeywell did not have a capable product at the time (Energy Axis was not available or ready). They were not actually considered viable for the project which was solely for AMR (no meter change-outs). This limited project was not successful for MLGW.

#### MILESTONE: 3/30/2012 – MLGW began preparation for a projected 2012 RFP with AMR and meter change-out expectations for electricity, water, and gas requirements.

The AMR project was not universally accepted and not appreciated by many at MLGW, nor by the citizens of Memphis. There was formidable pushback on this project, too numerous to list. EYSCO acknowledges the effort that was required of MLGW executives, management, and the measurement personnel. These MLGW people are "measured" and extraordinary professionals of the highest credentials and class! Notable MLGW personnel that guided and directed the project were: Jerry Collins, Chris Bieber, Virgil Deanes, Eliza King, Michelle Rhinehart, Wally Kellett, Aubrey King, David Vick, and many more.

#### MILESTONE: 12/21/2012 – Honeywell (legacy) Elster Solutions and their associates (EYSCO and others) were awarded the MLGW beta AMR/Meter Change-out as the project contractor.

These preparations in early 2012 required significant monitoring by EYSCO. Recognizing the potential, EYSCO interacted with Elster Solutions on the scope and preparation of the project, and, as liaison between the two Honeywell entities, also kept AMCO informed.

#### MILESTONE: 2/14/2013 – MLGW RFP on Smart Meter beta project for deployment of a total of 60,000 meters (electricity, water, gas) and AMR modules including 20,000 gas meters and AMR modules.

EYSCO fully understood that the success of Elster Solutions and AMCO with the beta AMR/ Meter change-out program was a critical step in the awarding of a full AMR/Meter change-out program. The successful installation and functioning of 60,000 meters and modules beta, as well as the entire scope required for the AMR system, was crucial. After the February 2013 RFP was issued, there were months of effort, meetings – both in Memphis and at other locations – and countless Elster Solutions-EYSCO discussions.

Elster Solutions was the integrated bidder in the role of general contractor, led exceptionally well by Mike Caranfa, Jim Schreiber, John Carter, Kevin Klinge, and many more Elster Solutions people and their partners. EYSCO was fully responsible for directing the gas interface between MLGW and Elster Solutions / AMCO. As Elster Solutions were only first introduced to MLGW in 2012, and began significant engagement with the 2013 RFP, Elster Solutions recognized and acknowledged the critical role of their "gas partner SME" – EYSCO. They brought gas measurement expertise that Elster Solutions needed and years of experience working with MLGW. Mike Caranfa's group was outstanding with the highest integrity and competency throughout the critical beta endeavor.

Honeywell Elster Solutions being awarded the project was the result of many people's efforts, but the role of previous EYSCO milestones was a decisive key element, a fact acknowledged by Elster Solutions.

With numerous AMCO products as the "preferred" product for gas at MLGW, the impact on the RFP beta award and the future full AMR project cannot be underestimated. With AMCO being "preferred" supplier, it provided Elster Solutions with an incredible advantage over the other AMR bidders. In fact, such an advantage that the premier AMR competitive supplier (who also has meters) did not submit a bid on the beta RFP, which led to their not being considered in the full bid evaluation.

Following the 12/20/2008 MLGW Mercury milestone, another Mercury milestone was achieved which was connected to the 2008 milestone.

#### MILESTONE: 11/1/2014 – Mercury was awarded a MI Wireless project of 600 comm boxes – \$1.2m.

This award's nexus was the result of the trial units in February 2010, as EYSCO knew about MLGW's intention to start remotely accessing their C&I meter data via cellular communications. MLGW did not have any prior experience with the new CNI2e modem (actually had never seen the modem) nor virtually any product data. Guided by EYSCO analytical and system references, MLGW measurement professionals' exceptional due diligence concluded that the MI Wireless and CNI2e were the best products.





MILESTONE: After the conclusion and successful implementation of the beta program in 2013 and 2014, MLGW issued an RFP for a full system-wide AMR/Meter Change-out program in December 2014.

With this RFP, EYSCO and the other Honeywell Elster Solutions partners began the massive undertaking of comprehensively preparing the bid to best position Honeywell for success As per EYSCO's stated "Doctrine" (see EYSCO. com), "our primary mission is to maintain equal balance and provide support for two of EYSCO's three most critical and vital assets - our Principals and our Customers; with the third asset being EYSCO team members, as all three are essential for EYSCO success! For our Principals, ensuring "differentiation" means assuring the qualities of their products are known and recognized. For our Customers, ensuring the products we offer are appreciated for their value in meeting the expectations they require."

For MLGW and Honeywell, the "differentiation" was achieved!

While AMCO was positioned as the "preferred" diaphragm meter for the project, the rotary meter was less certain. Although the RPM meter was approved in 2002 – providing the meter until the RPM was discontinued – in 2014, the RABO was still in its infancy. With two other incumbent competitors' rotary meters at MLGW, Elster Solutions was faced with submitting a bid using one of these.

With virtually no technical information available, Mike Chitwood – EYSCO Account Manager – presented the limited resources EYSCO and Honeywell had on the RABO to MLGW. The lack of data wasn't the only hurdle, as MLGW usually required a twelve (12) month field test of any product being considered for acceptance. The fact that MLGW approved the RABO and specified it as "preferred" was no easy or simple task. The approval of the RABO and the rewards are no doubt the result of having a quality Honeywell product as well as the foundation of trust and confidence which EYSCO earned over many years at MLGW. MILESTONE: 3/31/2015 – Short List Presentation to MLGW by Elster Solutions and partners, including EYSCO. Although Elster Solutions and their partners were confident that the presentation was compelling and valued by MLGW, the evaluation by MLGW was an extensive process, as the decision required significant due diligence given the scope and costs.

MILESTONE: 4/10/2015 – MLGW Notification of Intent to award Smart Meter – AMR/Meter Changeout contract number 11776 to Elster Solutions as the contractor for the project estimated to value \$257m, the largest single project award in the history of Honeywell (legacy).

MILESTONE: This award included 5900 RABO meters for the total scope of the project, which is the largest single order worldwide for RABO rotary gas meters. As is clearly seen from this article, the foundation for this success required many years of devoted and measured effort, well before the 2014 Smart Meter – AMR/Meter Change-out RFP. It required ongoing and continuing effort to ensure success. It was not simply a common response order accepted from a customer requesting "commodity widgets", as in our business it rarely - if ever is a matter of simply sending widgets. Attaining what is often referenced in this article – "Preferred" product status is a considerable achievement, as the word "Preferred" often has a deeper and more involved meaning or context.

We at EYSCO are proud of the job we have done and that we have met the expectations which Honeywell has of its professional sales group. EYSCO believes Honeywell HPS sales channels are unequaled in this market, and many have had and will continue to have major successes like EYSCO has had at MLGW. Honeywell, a company of the highest integrity and honor, recognizes the value and contributions of its sales channels on projects like MLGW. EYSCO congratulates Honeywell on the success and rewards enjoyed with MLGW. There are future values to be gained from the efforts of many and there are benefits that Honeywell has and will continue to derive from the recognition and acknowledgements of the products and services provided to MLGW!

Ed Young, Jr and the EYSCO (Ed Young Sales Co) team

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