Know by ‘Heart’: Flowmeter technology of the future

Endress+Hauser’s Flow Product Marketing Manager Nathan Hedrick and Environmental Industry Manager Alan Vance share the latest on the Promag 400 line of electromagnetic flowmeters featuring specialized sensor technology. The two served up details on the sensors’ web capabilities, proprietary “Heartbeat Technology™,” and advanced safety features.

As the eyes and ears of a treatment plant, few tools are as crucial in the water industry as sensors. It follows suit that any advantage you can get in sensing technology is one worth pursuing.

Promag L 400

Promag W 400

Q: What is an ideal type of facility or condition for implementing the Promag W 400 and L 400?

A: Our Water/Wastewater industry optimized sensor is the Promag L 400. Our typical recommendation is to use the Promag W 400 in subgrade applications when the flowmeter is mounted inside a vault or pit. So, Promag L 400 above-grade, Promag W 400 subgrade.

The Promag W 400 is a fully welded sensor design coated with an anti-corrosion paint for direct burial in the ground. Our engineering has developed a special anti-corrosive coating that we put on the sensor exterior which is a significant advantage over manufacturers who require the use of Denso™ Tape.

Q: What are the chief advantages of a sensor with integrated web capabilities?

A: First of all, it allows our customers a service interface with no special tools or software required. That means free and easy access, instead of purchasing interface tools that they have to keep track of and downloading and installing software, which ultimately requires IT involvement. That is actually a pretty big advantage. The customer simply needs a laptop with any of the most common internet browsers and a standard Ethernet cable. It’s something we’re all familiar with and can easily adopt and make use of.

Another advantage is the remote access that it grants. Flowmeters can actually reside on those same networks to allow a maintenance engineer to log into the device from the control room, to check diagnostics, perform an on demand verification against the magmeter’s original wet calibration change settings, or download the configuration for storage or duplication onto another device.

Q: Can you describe the Heartbeat Technology™ that went into the sensors?

A: Our Heartbeat Technology has three aspects. First is Heartbeat Diagnostics (along with Heartbeat Verification and Heartbeat Monitoring), which is included on all devices. It continually audits the meter to ensure that it is operating at peak conditions. What’s unique about our diagnostics capability, though, is how we classify and report events to our customers. Any event besides what we would call “System OK” or a “green light area” is provided with a suggested remedy. That prevents the customer from having to find the manual and dig through hundreds of pages just to find out what to do. Additionally, those diagnostics are classified into a number of categories, which help inform the customers as to how urgently they need to address the situation. We are all looking to do more with less, to maximize the efficiency and effectiveness of our personnel resources, and Heartbeat Diagnostics helps our customers achieve this goal.

Endress+Hauser

People for Process Automation

Q: What is Heartbeat Verification and how does it help the customer?

A: Heartbeat Verification is an onboard traceable verification technique, which requires no special tools to run. It can even be performed remotely through the web server or through the customer's digital network. What makes our verification technique so unique is that we have an independent third party attestation. This means that no longer is it only the manufacturer telling you that their own meter is working.

We have attestation that offers confirmation to the claims we are making, which should offer our customers additional confidence. Why is this so critical? Well, there are four reasons that we have found that a customer wants to perform verifications. One, they have an internal quality policy which requires it. Two, they have a contractual obligation to do so. Three, it's part of their safety program. And, four, it's required for regulatory purposes. Now, these last three in particular all have one thing in common: the customer needs documented evidence that the meter is functioning properly. Heartbeat Verification gives our customers confidence that this is going to be the case, as a test to ensure that the meter is still performing within the original specifications that were provided when it left the factory.

On top of that, they can generate a certificate to prove it. Customers have a couple of different options as to how they can make use of it. They can either purchase it, so that it's an open option for their own use, or they can hire our trained and qualified service organization to accomplish this task for them. Particularly in cases in which they report this documentation, it's actually our recommendation that they mitigate their own responsibility and risk by using our service organization to complete verifications, print out the reports, and ultimately, there are spots for us to sign off on the reports prior to handing them over.

Q: How does web integration help the customer in this case?

A: The big thing with water and wastewater customers, especially with the verification, is when they install a meter today, they want to know six months or a year or two years from today that the meter is still verified to be within the original calibration information.

Now, on smaller meters, they could take the meter out, send it back to us, and we can calibrate it. Where this comes into play is on the bigger meters that are way too heavy and take too much time to pull out of a line. Our verification method requires no additional handheld device or calibrator that the customer has to purchase; everything is done through the web server.

Everything's going to have this integrated web server in it, and again, people understand having the laptop and the standard Ethernet cable. That really makes it simple for the end user. That's why we're moving in this direction, not only with our flowmeters but with other products as well.

That is probably the most popular way that technicians or operators perform the verification, through the web server. But the customer can also do it locally if that's their preference. They can also perform it through their control system.

Q: How has magmeter technology changed in recent years? How does the Promag take advantage of these innovations?

A: We all know that the municipal industry can be quite price-sensitive at times. It does seem that, over time, we've started to hear more and more that a mag is a mag almost like a commodity. But our Endress+Hauser magnetic flowmeters are quite different. Our USA manufacturing facilities located in Greenwood, IN completed a $45m expansion last year adding over 200,000 sq. feet to our existing facilities and are fully ISO 9001 certified. Endress+Hauser has the most accurate flowmeter calibration rigs in the industry that are ISO/IEC 17025 accredited as well.

On the innovation side, we believe its primary innovation is how we get information from these devices into the plant's control system. The first component of that is how we interact with them. Our customers are always looking for a solution that is simple and easy to use, because they face resource limitations and have a need to accomplish a multitude of tasks that are not solely centered around instrumentation. We've improved our programming structure to make it more intuitive and only ask the customer to input the minimum amount of information, which covers the vast majority of applications.

We've also added flexibility to how and where the customer interfaces with these devices. They can use the local display, communicate to it through a digital network, and access it through the web server.

Q: What are the energy savings found in the Promag?

A: Compared to a leading competitor in electromagnetic flow, we can promote a power consumption of up to 45 percent less. Many customers have remote sites without power that use solar energy to power our Promag meters. However, I will also add that energy savings are not always about the power consumption of the meter itself.

There are inherent energy savings when using a full-bore meter such as a Promag meter over another measurement technology, because there's no pressure loss. It saves energy for the customer because they don't have quite the burden on the pumps. It reduces the pump usage.

Q: What is the expected lifespan for the sensor?

A: We rarely see sensor failures that are not caused by the process or some external factor. There are no moving parts, there's no restriction to the process flow, and with the Promag meter in particular, there's no regular maintenance required to keep it operational.

If the customer has an application in which buildup is expected, they would ideally pair it with Heartbeat Monitoring, so they know when to perform a cleaning cycle. But really, the sensor failures are generally not instrument-caused.

One thing I might add is that the 400 series will be our optimized transmitter for water and wastewater moving forward. The series before this is our series 50/53, which we still manufacture. Let's say that a customer with a magmeter had a lightning strike, or someone left the cover off the enclosure, water got in it, and the transmitter got damaged. Our new 400 series is backwards compatible to that sensor. The customer doesn't have to bear the cost of replacing the sensor, which can be quite expensive, especially in a larger size. They can keep the sensor in place, keep the same cabling, if it's remote, and just add a new 400 transmitter as well.

These magmeters will last a very, very long time. It's not uncommon to get well over 20 years out of a magmeter — or longer, really.

Q: How does touch control make it safer to operate a sensor?

A: The primary benefit of touch control is, of course, not needing to open the housing to perform programming directly at the device. This is particularly important in hazardous-rated areas, because you're ensuring that any potentially explosive gases are kept apart from the electronics.

"Endress+Hauser's Heartbeat Technology will make a difference for water and wastewater customers"

Alan Vance, Environmental Industrial Manager, Endress+Hauser

Alan Vance began his work with process control and instrumentation more than 31 years ago. He received his Bachelor's degree from Slippery Rock University. He went on to La Salle University where he received his MBA in Marketing.

He began his career working for Fischer & Porter, where he worked for seven years as a Product Manager for Recorders. From there, Alan went on to work for an instrumentation representative company for 22 years, where he focused on water and wastewater, power, mining, as well as the food and beverage industries in Florida.

In his current role with Endress+Hauser, he is responsible for the water industry. In this capacity, Alan does strategic planning and marketing of products used in the water industry. Along side of that, he is in charge of many operational activities like training, working with representatives, and meeting with customers. Alan has worked with Endress+Hauser for three years.

"We are all looking to do more with less, to maximize the efficiency and effectiveness of our personnel resources, and Heartbeat Diagnostics helps our customers achieve this goal."

Nathan Hedrick, Flow Product Marketing Manager, Endress+Hauser

Nathan Hedrick has more than six years of experience consulting on process automation. He graduated from Rose-Hulman in 2009 with a Bachelor's degree in Chemical Engineering.

He began his career with Endress+Hauser in 2009 as a Technical Support Engineer. After two years in that position, Nathan became an Inside Sales Engineer. Later, he went on as a Systems Product Specialist supporting digital communications, such as HART, as well as engineering solutions, including RSLogix. After a few years, he went on to work as the Technical Support Team Manager for Temperature, Recorders, and Systems.

In 2014, Nathan became the Technical Support Team Manager for Flow where he was responsible for managing the technical support team covering the Flow product line. He has recently taken on the position of Flow Product Marketing Manager.

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Endress+Hauser, Inc.
2350 Endress Place
Greenwood, IN 46143
Tel: 317-535-7138
Sales: 888-ENDRESS (888-363-7377)
Fax: 317-535-8498
info@us.endress.com
www.us.endress.com

Endress+Hauser
People for Process Automation