

Water reliability for the region

Endress+Hauser flowmeters monitor springs in the southern Black Forest region

Persistent droughts and heat waves in many regions of the world are forcing cities and municipalities to place a stronger focus on the reliability of the water supply not only by optimizing their networks but also by searching for additional sources that could contribute to long-term reliability. Two examples in the German county of Lörrach show how measurement and automation technology specialist Endress+Hauser supports numerous communities with innovative flow instruments.

The municipality of Steinen in the southern part of the Black Forest uses on average 1,800 cubic meters of drinking water per day – half from deep wells and half from around 30 springs. Persistent droughts in recent weeks have led to a significant shift in this distribution. “At the moment we get around one-fourth of the drinking water from the springs – the remainder we can cover with the deep wells,” says water specialist Axel Grether. While water levels in the springs are fluctuating heavily, to date the deep wells have remained quite stable despite the ongoing drought. The level dropped only 50 centimeters between January and the end of July.

“This gives us an edge over other communities whose only source of water is springs,” says Dietmar Thurn, head of the building authority. The municipality with a population of 10,000 also modernized the water network and installed pump lines and numerous measurement instruments from Endress+Hauser in recent years to monitor the flow and quality of the water. The measurement values are available in real time, providing a better and much faster way to identify and contain leaks in the network. “We’re well positioned for the coming years thanks to these investments,” explains Dietmar Thurn. Districts such as Endenburg, part of which sits more than 900 meters above sea level, can now be serviced from the deep wells in case the supply from the local springs is temporarily insufficient. Thanks to the measurement instruments, municipal employees can view a display screen in the central water treatment plant in Steinen to determine how much volume is being discharged from the springs. “In the past we had normal meters without data transmission. Now we see the values down to the second, plus we don’t have to drive to the catchment chambers as often, which is a big step forward,” reports Alex Grether.

New springs under constant monitoring

While Steinen believes the municipality is in a good position, climate change is nevertheless forcing them to think about the future. “We don’t know how things will look in 10 years,” explains Dietmar Thurn. To prepare for possible shortages, Steinen is currently employing prototype flowmeters in cooperation with Endress+Hauser for long-term monitoring of two springs in the districts of Weitenau and Schlächtenhaus. Although once part of the regular water supply, these springs are now only being used as a reserve for firefighting because the quality does not adhere to the latest drinking water regulations. “Permanent use of these springs requires costly water treatment,” adds Axel Grether. The

water specialist is interested in how the persistent drought period is impacting the springs. Thanks to the integrated mobile connection, he can access the collected data via a smartphone.

Ralf Maier, Grether's coworker who is located several kilometers upstream in the city of Zell im Wiesental, is also using this function in the same model of flowmeter to monitor a previously untapped spring in the middle of the woods on Zeller Blauen, a mountain that's roughly 1,000 meters tall. Since the spring is still reliable despite the ongoing drought, it could be an interesting source for the mountain village of Blauen if the town's existing spring discharges continue to recede in the long term. "It used to be that one out of every ten summers brought extreme heat. Now we're experiencing droughts every two to three years. We can barely cover these peak periods up here with the existing spring water," explains Ralf Maier, technical operations manager of the Zeller water utility since 1999. "We're monitoring the spring to see how it flows over a long period of time and to determine how it reacts to climate change."

Digital measurement technology instead of a bucket and stopwatch

The discharge from the spring has been monitored for four years already – most recently with a flowmeter from Endress+Hauser. "With a battery life of up to 15 years and special corrosion protection, the instrument is designed for reliable long-term operation," explains application engineer Ralf Schweigler. The instrument not only saves the water specialist from manually measuring the discharge with a bucket and stopwatch, but also cuts out most of the weekly drives up the mountain. Considering the 70-kilometer-long pipeline network and limited personnel resources, these tasks were nearly impossible to manage. Instead, the data is encrypted and transmitted directly to a smartphone, and can also be retrieved via a PC in the office.

The city of Zell has traditionally focused on its mountain sources. More than 70 individual springs, in addition to two deep wells in the valley, are used to provide water to around 6,300 residents spread out over a 36-square-meter area that includes numerous districts. Most of the spring discharges are abating more and more during the summer, however. "We always had dry periods, but not with the frequency we have recently experienced. Additional pumped supplies will certainly be needed during extreme periods in the future," emphasizes Ralf Maier. With this in mind, the city plans to commission a structural assessment of the water supply at the end of September. The report will analyze the current state of the infrastructure and determine where improvements are required in the coming years so that residents will continue to enjoy a reliable supply of drinking water in the future.

Among other things under discussion is the construction of a pump line in the district of Gresgen. But as Ralf Maier points out, "The city council only subsidizes water projects that ensure long-term reliability." The water specialist says it will be some time yet before enough information is available for the assessment, but adds that "It's important to already be thinking about the water supply over the mid and long term. Our colleagues in Steinen have already accomplished this task, but we're still in the initial phases."



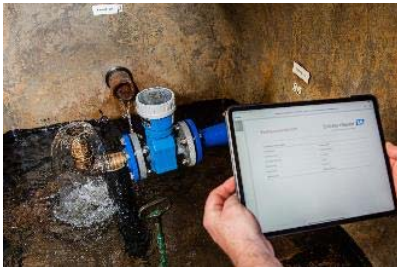
EH_Hägelberg.jpg

Axel Grether, water specialist in Steinen, monitors the current spring discharges in Hägelberg from the office.



EH_Weitenau.jpg

In the district of Weitenau (Steinen), an Endress+Hauser flowmeter was installed at a spring currently used only as a reserve source of water for firefighting in order to monitor the discharge over a longer period of time.



EH_Weitenau_2.jpg

As well as being displayed on the instrument, the measurement values can be retrieved with a tablet.



EH_Hägelberg_2.jpg

The raw water from the Steinbruch, Heilisau and Schönenbach springs flows into the catchment chamber in Hägelberg. All three are monitored with Endress+Hauser instrumentation.



EH_Steinen.jpg

The pH value is also measured as part of the quality analysis during treatment of the raw water for the potable supply network.



EH_Zell.jpg

The spring on Zeller Blauen is in the middle of the woods, meaning that the discharge can only be monitored with a battery-operated flowmeter.



EH_Zell_2.jpg



EH_Zell_3.jpg

Application engineer Ralf Schweigler views the measurement values of the spring discharge on Zeller Blauen with a tablet. A separate transmitter (square device seen in the picture) can be used to transmit the data to the office PC or the cloud.

The Endress+Hauser Group

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Endress+Hauser devices, solutions and services are at home in many industries. Customers thus use them to gain valuable knowledge from their applications. This enables them to improve their products, work economically and at the same time protect people and the environment.

Endress+Hauser is a reliable partner worldwide. Its own sales companies in more than 50 countries as well as representatives in another 70 countries ensure competent support. Production facilities on four continents manufacture quickly and flexibly to the highest quality standards.

Endress+Hauser was founded in 1953 by Georg H Endress and Ludwig Hauser. Ever since, the company has been pushing ahead with the development and use of innovative technologies, now helping to shape the industry's digital transformation. 8,600 patents and applications protect the Group's intellectual property.

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