

Check your flow to save water and energy

Freshwater is an increasingly scarce resource. So, it is essential to use it as efficiently as possible. That requires reliable, low-cost flow rate monitoring for the home and office as well as in industry and agriculture. But domestic water flow rate monitoring is also key to the effective use of other critical resources such as energy.

The world may be 70% covered by water but only 3% of that is freshwater. And around two-thirds of that freshwater is not available for human use. With climate change disrupting weather and water patterns around the world, it is not surprising – yet deeply alarming – that as much as two-thirds of the world’s population could be facing chronic freshwater shortages by 2025.

Society, then, needs to think carefully about how it uses its freshwater resources. Of course, industry and agriculture are major consumers of freshwater. But individuals, too, can do their part to reduce freshwater consumption. At the same time, people don’t want to give up their comfortable way of living.

Protecting scarce natural resources

So, there is increasing interest in applications that enable efficient use of water around the home and significantly reduce annual water consumption. For example, [smart faucets](#) that deliver precise volumes for cooking and cleaning – from tablespoons to gallons. Or garden irrigation systems that monitor [moisture levels in soil](#) and then deliver just enough to let plants thrive. At the heart of these low-waste systems is the ability to measure the flow of water precisely and reliably.

But accurately measuring water flow doesn’t just help save water, it can help reduce energy usage and carbon emissions too. Tankless water heating systems use such measurements to ensure they deliver instant hot water just when it is needed, rather than wasting energy keeping a full tank hot. And domestic heat pumps need to adjust the flow of heat transfer fluids to ensure the home is kept at the desired temperature in summer and winter.

Contactless: lifetime reliability and drinkability

Based on how sound pulses travel through the fluid, ultrasonic flow measurement offers many benefits over mechanical, rotor-based flow meters for these applications. First, with no moving parts there is less risk of failure, less maintenance required and less chance of particulate matter such as sand or soil interfering with measurements. So, meter lifetime and accuracy are higher while operational costs are lower. Second, as the measurement is contactless, there is no chance of the meter contaminating the liquid it is measuring – essential for drinking-water applications.



The easy way to ultrasound

Drawing on its extensive expertise in precision time measurement, SciSense has developed an ultrasonic converter technology based on time of flight. The converter can measure the difference between two ultrasound pulses – one traveling in the direction of flow, the other in the opposite direction – with picosecond resolution and stability. This difference is proportional to the flow rate of the liquid.

To simplify the use of this technology in end-user applications, SciSense has integrated it into a complete ultrasonic flow module: the [UFM-01](#). The UFM-01 combines an ultrasonic flow converter, microcontroller and power management into a spool piece with standard half-inch thread connectors and a cable connector supporting single-wire and UART interfaces. Made with food-grade material, it is suitable for both drinking-water and non-drinking-water systems at temperatures from 1 to 60°C.

Supporting flow rates from 0 to 2000 liters per second, the UFM-01 is ideal for water- and energy-saving flow rate meters in homes and offices. It is accurate to within 5% for flow rates above 60 liters per second and draws just 2 mA from a 5 V source. This long-lasting, cost-effective solution is the first in a range of flow modules from SciSense, with future versions supporting higher flow rates and larger thread connection sizes to enable further water- and energy-saving applications in horticultural, agricultural and industrial settings.

[Related links]

[UFM-01 Ultrasonic Flow Sensing Module](#)

[Smart faucets and water taps](#)

[Moisture sensing](#)