SIEMENS
Ingenuity for life

Increasing your level of ultrasonic knowledge

From echo processing to protecting your process

www.siemens.com/ultrasonic

Experience matters. Let's take a look!

Field-proven in more than a million applications worldwide

Since the early 1970s, Siemens has been industry standard for ultrasonic level measurement. This experience matters: level readings are reliable because they are based on Sonic Intelligence echo processing algorithms—which engineers at Siemens have been refining for decades!

And every device comes backed by Siemens' strong application experience and sales support, giving you the assistance you need when and where you need it.

But don't just take our word for it—see what operators at Agnico Eagle Mines have to say:

PDF True innovation and the advantages of experience

Intelligence based on experienced— watch here:

▶ Level Instrumentation: Intelligence Based on Experience

Keeping your pumps running

With storm events dumping major amounts of rain in a short period of time, flooding is a reality for many wastewater treatment plants.

When water submerges a radar device, it typically shows a loss of echo or high level, leaving you guessing whether the device itself is malfunctioning or if the problem is being caused by flooding conditions.

However, with the use of an inexpensive ultrasonic submergence shield, even when the transducer is submerged, it'll keep the pumps running. The shield creates an air pocket in front of the transducer face when it is submerged. The controller senses this condition and recognizes it as flooding, continuing to run pumps to remove the extra water from the wet well.

See this in action here:

▶ Submergence detection keeps pumps running

"The only source of knowledge is experience."

Albert Einstein

Sonic Intelligence: what is it?

How does it work? And what can it do for your process?

Sonic Intelligence separates true echoes from false ones—material echoes from those generated by obstructions or electrical noise.

The ultrasonic controller looks at each grouping of echoes (a shot) and processes the return to determine the true echo. It then selects the best echo—namely, the true material level.

These accurate and always-reliable readings are no accident, though! Using field-proven algorithms to provide intelligent processing of echo profiles, this "knowledge-based" technique produces superior performance every time.

What does this precision and reliability mean for you?
Your water/wastewater treatment plant is a busy place—and materials and conditions inside your tanks/vessels/wells are always changing. Sonic Intelligence selects the correct echo after every measurement and then uses powerful statistical techniques to give stable readings while still allowing rapid response to actual changes in the material level.

The result?
• Operations are more cost-effective

• Inventory monitoring is always precise

• Processes can be better controlled

• Expensive spill cleanups can be avoided
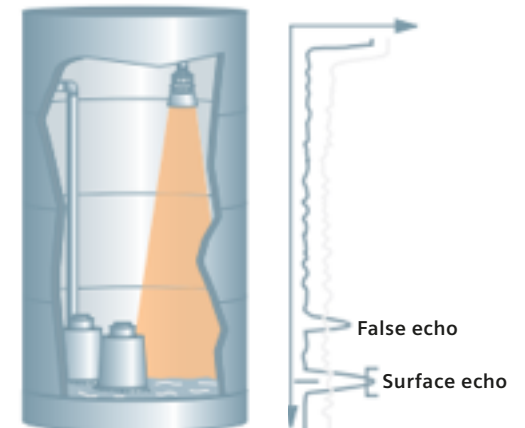
Back to basics with Sonics Intelligence
Learn more and test your knowledge in this series of elearning modules.

EPUB [Part1]   EPUB [Part3]

EPUB [Part2]   EPUB [Part4]

False echo

Surface echo

Obstructions? No problem!

Looking under the hood of ultrasonic technology

As echoes bounce back from the surface of the material, Sonic Intelligence software analyzes the information in its goal to find the true echo.

Even in a crowded wet well with ladders, pipes, and chains, Sonic Intelligence ignores all of these obstructions. How? Let's take a closer look:

What's a Time Varying Threshold (TVT)?
The TVT is used as a reference to compare echoes at different positions in time. A far echo will be weaker because the sound has traveled a greater distance, but near and far echoes must be compared in order to select the true echo.

Auto false-echo suppression
This feature automatically detects and suppresses echoes from vessel obstructions.

• Prior to activating the Auto False-Echo Suppression, empty the tank as much as possible.

• If there is an agitator, it should be operating.

• During the TVT Learn session, the controller fires pulses and shapes the TVT around any echo from an obstruction like the agitator. This shaping is easy to perform and does not require a computer.

Watch to learn more!

▶ [What is Auto False-Echo Suppression?](#)

Ultrasonics and great outdoors
While rain can slightly scatter an ultrasonic signal, this effect is insignificant over the short distances involved in environmental applications like open channels.

The same is true on very windy days—the speed of sound will change slightly, but for these water and wastewater applications, ultrasonic technology has significantly more signal than what is required and the ranges are very short, so the effect is, again, insignificant.

And since we're talking about dirty outdoor applications in the pre-treatment stages of a wastewater facility, it's worth mentioning ultrasonic transducers' self-cleaning faces, which literally shake themselves clean of dirt and buildup in your application.

Combined with intelligent echo processing software, ultrasonics ensure that dirty process conditions—and the great outdoors—don't affect measurement performance.

Meet the ultrasonics family!

Customer-driven features. Intuitive setup. Unmatched intelligence. And proven in industries just like yours around the world. Explore our complete portfolio of ultrasonic level instruments for applications across your facility.

Siemens Echomax transducers
provide trouble-free, reliable performance. Impervious to dust, moisture, vibrations, flooding, and high temperatures, Siemens transducers are easy to install and require little to no maintenance.
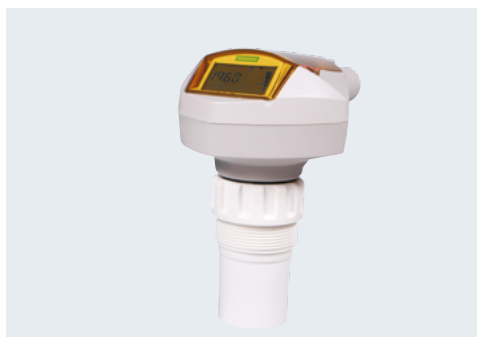
SITRANS Probe LU
is a 2-wire loop-powered level measurement transmitter for measuring storage vessels, filter beds, and open channel flow in the water and wastewater, food, and chemical industries.

SITRANS LU150/LU180
is a short-range, non-contacting ultrasonic level measurement transmitter. Designed for liquid applications, the device is ideal for continuous level measurement of liquids and slurries in open or closed vessels.

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SITRANS LUT400
are compact, single point, long range ultra-sonic controllers for continuous level or volume measurement of liquids, slurries, and solids, and high 1 mm accuracy monitoring of open channel flow.

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HydroRanger/MultiRanger
are versatile short- to medium-range ultrasonic single and multi-vessel level monitor/controllers for virtually any application in a wide range of industries.

i HydroRanger:
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i MultiRanger:
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Explore the optimal solution for your application from the extensive Siemens ultrasonics portfolio using the PIA Life Cycle Portal!

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PDF click here for advanced level information