

Just Brilliant

GWF4D technology®

 **sonico**®



Welcome to GWF's 4D technology®

We appreciate your interest in our cutting-edge flow measurement. GWF's 4D technology® has been developed based on our extensive experience in the water flow measurement domain – and started on a blank sheet of paper.

When we began the development, we wanted to do things differently. Our R&D team analyzed a variety of basic technologies – from magnetic inductive to fluidic oscillator, from acoustic to optical principles. Finally, we discovered the ultrasonic principle of «Time Reversed Acoustics (TRA)».

This principle has not been used in flow measurement before – and we were thrilled. Our initial research concluded that a measurement system based on TRA is capable of providing an unprecedented dynamic range, is very robust to water turbulences, and offers many additional benefits. We knew that industrializing this technology would be a challenge – but we gladly took it on.

Over the past years our team of experts across the globe has developed a number of patents and patent applications leading to our unique GWF 4D technology®. What we now consider as GWF's 4D technology® is the combination of our innovative, 4-dimensional time reversed acoustic signal processing, a high-performance electronic implementation, highly robust mechanics, and a modular approach to data communication and a modular approach for seamless network integration.

This brochure will give you a brief overview of our technology and two product series that build on our 4D technology®.

We look forward to engaging in discussions with you. Contact us.

Your GWF team

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Integrity

We uphold highest ethical standards in everything we do. We are loyal, honest, and respectful. Our customers, partners, and people can trust us to deliver what we promise.



Community

We build meaningful relationships with each other and with our stakeholders. We work as one team and help each other in achieving ambitious objectives.



Excellence

We appreciate the fact that our solutions are part of society's critical infrastructure. Our commitment to excellence is the basis for the trust we earn with our customers, colleagues, and partners.



« Highest accuracy from Switzerland. Since 1899. »



1 Family owned and committed to the future.
2 Founded in 1899 in Lucerne.

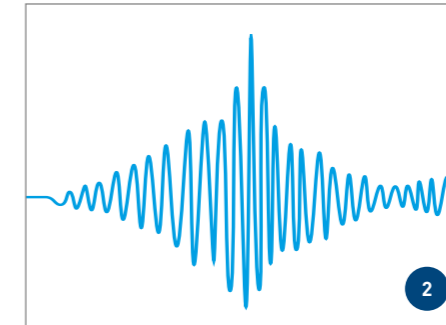
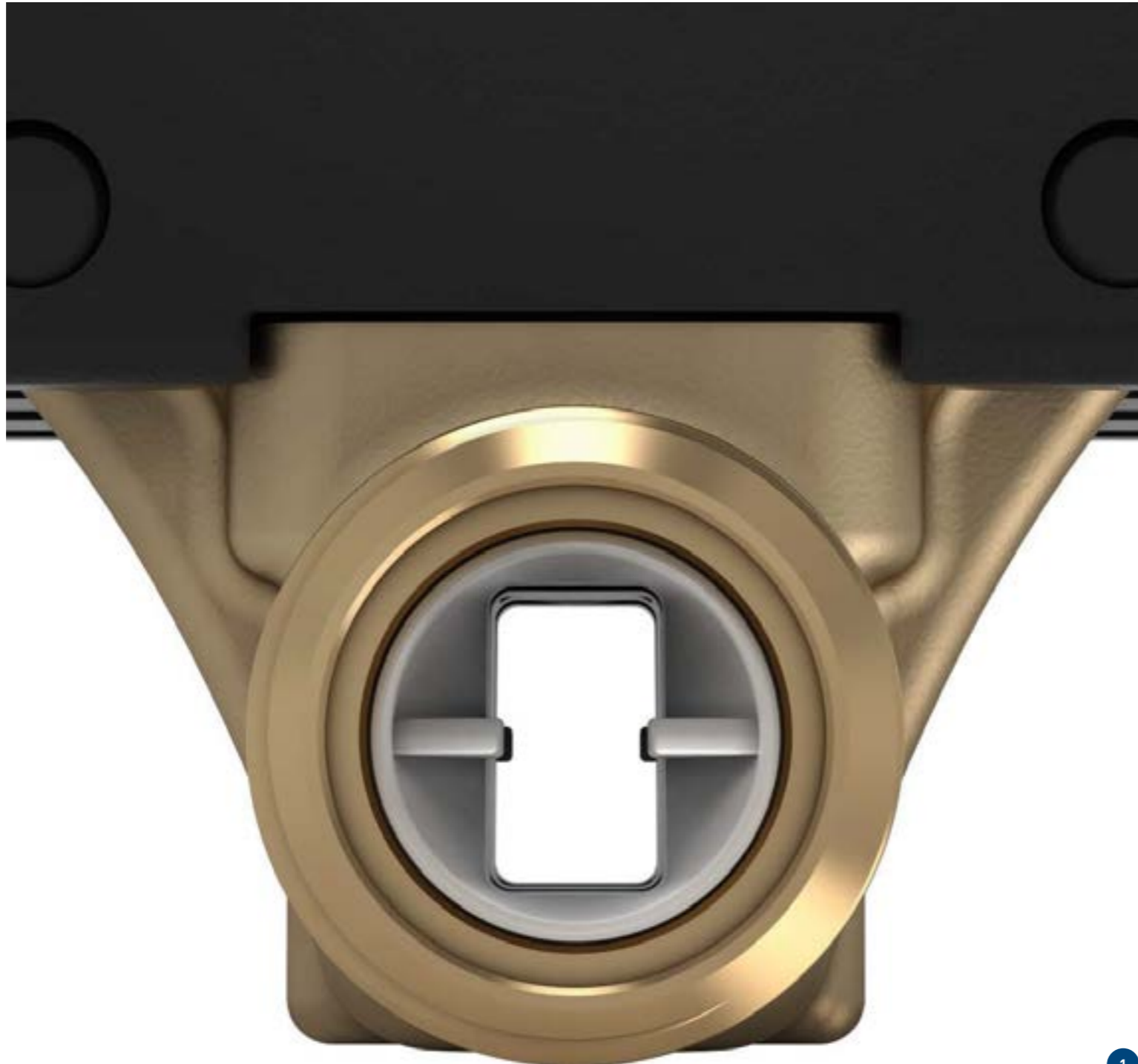
Rocket science

Highly robust mechanical design

Our unique approach to transducer handling and product integration leads to long-term product stability. Furthermore, our overall mechanical design in the sonico® product lines is cutting-edge: the sonico® series is designed for 20+ years in the field. The straight and empty pipe design without any cavities and with its dry transducers has clear advantages for all water and installation conditions. Finally, our material selection for housings, coatings and other mechanical parts meets highest utility standards.

4D ultrasonic signal processing

Based on our patented «Time Reversed Acoustics» approach, we developed a unique methodology for ultrasound signal processing and correction. Our signal structure does not follow a «path», instead we work in «planes», capturing the entire flow channel. Also, instead of using cumbersome and sensitive correction tables, we use proprietary correction algorithms based on the physical flow profile. This enhances measuring stability and repeatability of results even in adverse conditions such as strong flow turbulences.



High-performance electronic implementation

The implementation of our 4D technology® results in optimized signal generation and post processing of the measured data. Additionally, the signal-to-noise ratio is maximized at the receiver's end due to the patented method applied, which leads to high performance.

Seamless network integration

We have extensive experience with data communication and integration of devices into systems for billing, grid management and process control. Communication of collected data into wired, wireless, fixnet, drive-by or other communication backbones is critical to success for any of our devices. The ever faster changing standards, protocols and modules require highest possible flexibility. Our products are set up completely modular and offer open and flexible interfaces for systems integration.

- 1 Highly robust mechanical design
- 2 4D ultrasonic signal processing
- 3 High-performance electronic implementation
- 4 Seamless network integration by modular communication interface

sonico[®] EDGE

FURTHER INFORMATIONS
ABOUT SONICO EDGE ON GWF
WEBSITE:



Scan me to find out more!

Concept

sonico[®] EDGE has been developed for highly challenging measurements of fresh- and treated waste water in pressurized pipes. The product concept is modular and flexible in terms of overall mechanical design and communication. Sonico[®] EDGE is equipped with the latest GWF 4D technology[®].

Applications

sonico[®] EDGE is designed for flow measurement of water, e.g. drinking or utility water. Typical installation sites include reservoirs, water towers or pumping stations.

sonico[®] EDGE is suitable for difficult installation conditions such as placement directly before or after 90° elbows.

Value proposition

Besides the high turndown ratio that enables a dynamic measurement range between 0.02 m³/h and 90 m³/h (DN50) at highest precision, the devices are extremely flexible when it comes to installation conditions. GWF's 4D technology[®] allows for sonico[®] EDGE to be installed directly after or before 90° elbows, valves or pumps.

Due to the clean and open 4D-shape pipe design, the measuring device has unparalleled low pressure loss. Furthermore, the utility-grade IP68 design and excellent material selection result in highest product robustness.



4D technology[®] measuring accuracy

4D technology[®] offers a turndown ratio up to R1000 and is extremely robust against changes in the flow profile caused by bends, valves or pumps. The «Time Reversed Acoustics» principle enables a new level of measuring repeatability independent of flow conditions, electromagnetic or grounding interference and medium conductivity.

The sonico[®] EDGE advantages



sonico[®] EDGE DN50



sonico[®] EDGE DN80



sonico[®] EDGE DN100



sonico[®] EDGE DN150/200



sonico[®] EDGE DN250/300



Precision and Reliability

Accuracy independent of water quality:

The GWF ultrasonic measuring technology enables accurate flow measurements regardless of the water conductivity and quality.

Measures lowest flows for leak detection:

In comparison to other measurement technologies, the GWF 4D-Technology enables a benchmarking measuring range up to R1000 to measure lowest and highest flows.

Unaffected by fast flow changes:

sonico EDGE measures continuously with 4Hz to measure also fast changing flow velocities.

Bidirectional billing:

Recognizes automatically the main flow direction and is certified to bill in both forward and reverse directions.

Efficiency and Cost Saving

Reduced pumping costs:

The free flow measuring channel design results in low head loss and reduces loss in network pressure.

High installation flexibility:

The compact design allows for flexible installation under challenging conditions without additional earthing to save installation time and costs.

Smart configuration:

The GWF Life app enables customer specific metrology and communication configurations.

Durability and Quality

Quality commitment:

Made in Lucerne at highest quality standards with fast delivery times.

Sustainable and robust design:

The maintenance free and utility grade design reduces total cost of ownership.

Advanced Communication and System Integration

Flexible communication interface:

Exchangeable communication modules using NFC technology (Pulse, 4-20mA, Modbus, ECO) enables to upgrade the communication interface of the measuring point at any time later in the field.

Secure data backup:

The internal data logger ensures secure data storage and the encrypted communication interfaces protect against tempering.

sonico® NANO

Concept

The sonico® NANO flow meter, based on GWF 4D® Technology, sets a new benchmark for utility-grade accuracy with R1000 precision and robustness, covering sizes from DN15 to DN40. Designed for up to 20 years of field use, the sonico® NANO detects even the smallest leak flows and helps prevent grid contamination. Its high installation flexibility, combined with the integrated LoRa/wMBus dual mode, reduces installation costs and ensures seamless integration into

Value Proposition

sonico® NANO's measurement performance is unmatched in the industry allowing utility companies access to reliable and true measurement data. sonico® NANO delivers accurate and stable low flow measurements and leakage notification. To prevent contamination of the drinking water, the meter measures continuously the water temperature and dangerous reverse flows into the water networks or reservoirs. For transparent and correct billing of the water consumption, the forward, reverse and cumulative water consumption is measured together with various alarms and send by different end-to-end encrypted wireless communications to backend data management platforms. The product design allows for full flexibility in data communication.

The plug and play functionality reduces the installation costs and delivers installation flexibility by automatic flow direction. Together with the integrated dual mode, sonico® NANO connects automatically to the periodized LoRa WAN, or if not available uses the wMBus network for drive by or fix net readouts. The simple and seamless integration into the GWF infinio data management platform can be used for data management and optimization to the water grid. The sustainable manufacturing process and the robust design including a possible retrofitting increase the lifetime of the product, reduces CO2 footprint and ensures end of life recycling. Moreover, the meter software can be updated in field and over the air to increase product life cycle time and update for new features.



Applications

- > For domestic billing applications in drinking water networks up to 50°C water temperatures.
- > Smart meter networks with secure communication requirements for fix or drive-by networks.

4D technology® measuring accuracy

GWF's 4D technology® shows linear behavior in all operating regions, which is in laminar, transition and the turbulent flow. Thus, the 4D technology® clearly can be used in environments where a large dynamic range of 1000 and larger is required (e.g. low flow and leak detection, overflows, or bursts). In addition, this technology is insensitive to the media, pressure cycles, entrapped air as well as salinity. Furthermore, as an additional advantage, dry transducers can be used – this guarantees that a maximum possible overdrive flow in the meter can be measured without run-ning into cavitation. The flow tube incorporates no obstacles and hence, an extremely low head loss of 0.14 bar at nominal flow (Q3) is reported. The product design allows for full flexibility in data communication.

FURTHER INFORMATIONS
ABOUT SONICO NANO ON GWF
WEBSITE:



Scan me to find out more!

The sonico[®] NANO advantages



sonico[®] NANO DN15



sonico[®] NANO DN20



sonico[®] NANO DN25



sonico[®] NANO DN32



sonico[®] NANO DN40



Network Performance and Reliability

Accurate billing:

Measures accurately up to R1000, even at fast-changing flows and in challenging installation conditions.

Optimizes network performance:

Detects low-flow leaks or burst events to reduce water scarcity and maintain optimal network performance.



Secure and robust design

Secure data backup and encrypted interfaces:

The internal memory stores up to 4000 data points and the encrypted NFC and wireless communication interface prevents from tampering.

Secure installation and sustainability:

Carefully selected materials together with the utility grade design, enables applications in harsh environments, reduces total costs of ownership and the CO² footprint.

Network efficiency and risk Mitigation

Reduces network pressure losses:

The free flow measuring channel design reduces head loss and network pumping costs.

Mitigate risks for network contamination's:

To mitigate network contamination risks, sonico[®] NANO provides the water temperature and sends alerts in case of back flow measurements.

Seamless network integration

Customer friendly data interfaces:

Open API communication interface for direct integration into customer specific data management systems.

High integration flexibility:

Detection of water flow direction and dual mode for automatic fixnet or drive-by network integration.

Flexible commissioning:

The GWF infinio backend system together with the GWF LIFE app enables secure key handling and in field network integration.

Production and Test Center

Test benches for product development and production

GWF has a legacy of efficient and high-quality production in Switzerland. Since 1899, we manufacture gas and water meters at our headquarter in Lucerne. To manufacture the sonico® product line, GWF invested in world-leading production test benches. We open our doors to experience our bench marking production lines and cutting edge flow measurement test center in Lucerne.

1 sonico® EDGE production line in Lucerne "LUZ1"

2 sonico® NANO test bench in Lucerne "LUZ21"





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Specifications are for instruments at the time the literature was printed. Due to continuous product testing and improvement, all specifications are subject to change without notice.

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