Just brilliant.

GWF 4D technology®

Innovative measurement solutions
for valuable resources

Intro

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

When we started the development, we wanted to do things differently. Our R&D team analyzed a variety of basis 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 really excited. Our initial research concluded that a measurement system based on TRA is capable in 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 developed out of the raw physics 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 systems integration.

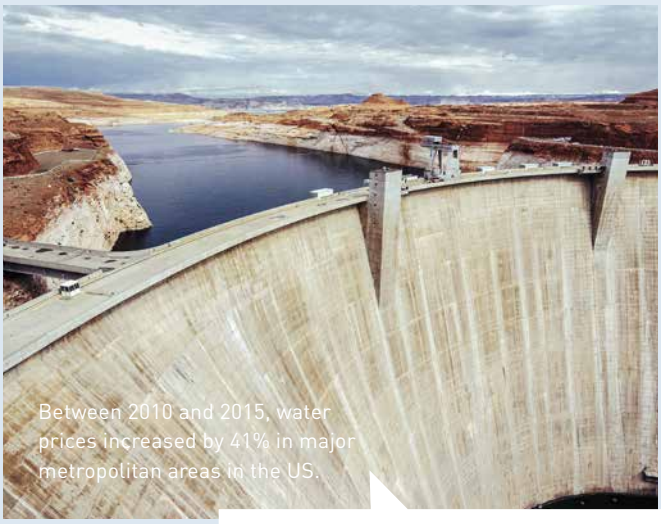
This brochure will give you a brief overview on our technology and two product series that build on our 4D technology.

We look forward to engaging in discussions with you. Please do not hesitate to contact us.

Your GWF team

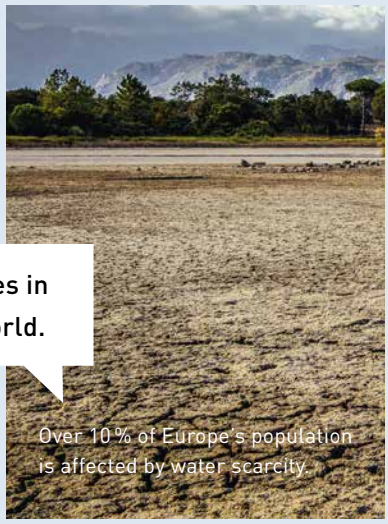
CONTENT

The water challenge



Between 2010 and 2015, water prices increased by 41% in major metropolitan areas in the US.

Water and waste water management will need to become more accurate.



Over 10 % of Europe's population is affected by water scarcity.

Water scarcity increases in many regions of the world.

33 countries will face extreme high water stress in 2040.

Water will be a source of conflict and unrest in the future.

Water treatment is becoming a larger topic.

Dubai is sourcing 98% of its drinking water from desalination plants.

Urbanization will require infrastructure investments.

One quarter of the population in larger cities have stressed water supplies.

GWF's objectives

Great people.
We jointly develop a work environment for motivated team players who enjoy their roles and responsibilities, take an active part in creating the future of GWF and keep pushing their own development.

Winning with value.
We create long term value for our customers and partners with our leading products, systems and services; by doing so, we contribute to the responsible use of valuable resources.

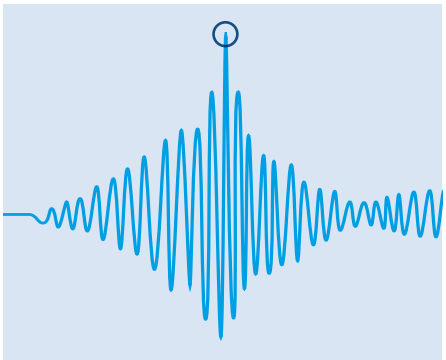
Future oriented.
We generate robust economic profit for further investments in innovation, the progressive development of our company and the preservation of our independence.

You can't preserve, what you can't measure. That's why we are committed to deliver innovative measurement solutions for valuable resources.

Family owned and committed to the future.

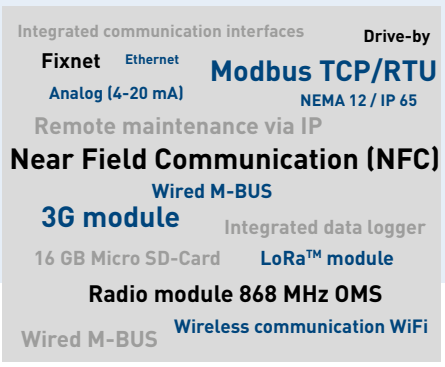
Founded in 1899 in Lucerne.

Rocket science.



4D ultrasonic signal processing

Based on our patented time reversed acoustic approach, we developed a unique methodology to ultrasound signal processing and correction. Our signal structure does not follow a 'path', instead we work in 'panes' capturing the entire flow channel. Also, instead of using cumbersome and delicate 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, e.g., 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 significantly. Also, the signal-to-noise ratio is maximized at the receiver's end due to the patented method applied, which leads to high performance.

Highly robust mechanical design

Our unique approach to transducer handling and product integration leads to long-term product stability. Also, our overall mechanical design in the ReVision and sonico® product lines is cutting edge: in the ReVision products, our unique transducer housings allow for internal and external installation. 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 standards.

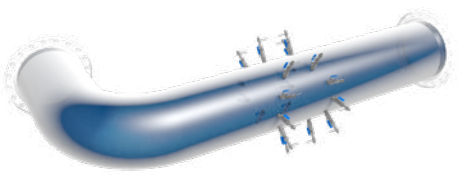
Modular approach to data communication and systems integration

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.

ReVision

Concept

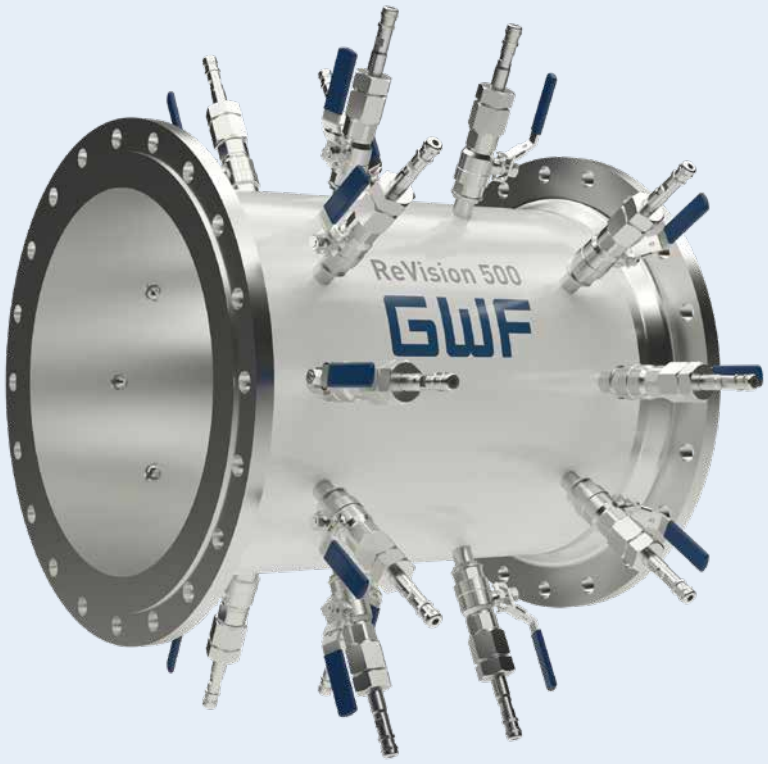
Space constraints and/or appropriate application configurations lead to complex industrial pipe flows which contain bends, tees and/or other disturbing and non-uniform elements. This leads to difficulties in installing flow meters at a recommended 'optimum' location, which is defined by a minimum distance upstream or downstream of known disturbances like a bend or pump where a fully developed velocity profile is present. Even with multiple flow sensors, there may still be a significant error.
Flow meters are also sensitive to velocity profiles where there is a large rotational component (swirl). Swirl is normally generated by two or more out of plane changes in flow direction (e.g. one bend/tee that goes from vertical to horizontal followed by an bend/tee that changes the direction of flow in the horizontal plane). Swirl is present to some extent in almost every application and can generate significant transverse velocity components plus it takes a long distance to dissipate. If the swirl is not centred, it can cause significant errors. Thanks to the predetermined conduit configuration parameters and correction factors, ReVision's measurement accuracy is kept when asymmetric profiles and swirls are present in the pipe. The high measuring accuracy has been certified by independent test centers.



Flow meter after a 90° bend

Clamp-On Transducer

When combining ReVision with clamp-on transducers, the flow measurement becomes non-intrusive and easy from the outside of the pipe. The transducers are installed with little technical effort and without process interuption on the pipeline. The special construction of the transducer mounting allows for removal of the transducers without changing the position of the mounting itself.



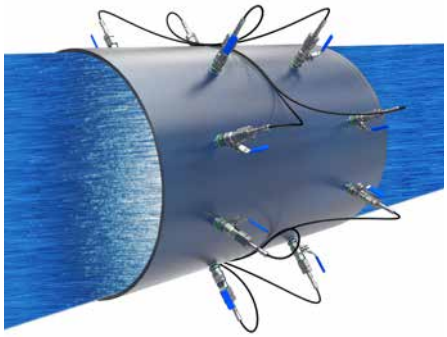
Application

Flow measurements are very often mandatory in the area of **water supply** and **industry**. Quite frequently the pipe systems are complex and contain valves and pumps. Additionally, there are space constraints, leading to difficulties in installing flowmeters at a recommended 'optimum' location, which is defined by a minumum distance upstream or downstream of known disturbances like an bend or pump where a fully developed velocity profile is present. ReVision is able to increase your profitability with exceptional repeatability and linearity throughout the flow range. Due to the **patented** velocity profile compensation no flow straightener is needed and no on-site calibration is required.

ReVision is used for highly accurate flow measurements in water distribution networks and hydro power plants. The system is based on the well established acoustic transit-time principle. The digital signal processing allows detection of even the smallest time differences, i.e. even the smallest amounts are being determined accurately. Common installation effects, e.g., after an 90° bend are taken into acount by patented corrections of the disturbed velocity profiles. No more need for the long straight runs in front of and after the flowmeter. Installation of a flow straightener is no longer necessary saving you time and money.

Advantages

- Highly accurate flow measurements ±0.15%
- Certified by independent test center
- No on-site calibration needed
- No flow straightener needed U0/D0
- Patented velocity profile correction
- Fully integrated metering solution



The sonico® advantage!

Robustness by design.

Robustness through well selected materials and elaborate mechanical design to avoid tampering and influence from external factors such as temperatures.

Longevity by design.

Clean and straight measuring pipe without cavities results in lowest pressure drop as well as long lifetime and measurement stability.

Accuracy by design.

Highest accuracy across the entire flow profile detecting flows of as low as 20l/h and up to 100m³/h (DN50) leading to cutting edge dynamic range.

Plug and play.

Future proof connectivity with modular, field-exchangeable communication modules allows integration in any communication backbone.

Highest Adaptivity.

Simple installation in U0/D0 90° bend setting as well as other challenging measurement points with measurement stability across the entire flow range.

One-Tech fits all.

One technology fits all meter sizes from DN50 to DN300 and all measurement point requirements for simplified inventory management and installation procedures.

sonico® EDGE and VANTAGE

sonico® EDGE

Concept

sonico® EDGE and sonico® VANTAGE have been developed for highly challenging measurments of fresh water flow in pressurized pipes. The product concept is modular and flexible in terms of overall mechanical design and communication. Both products are equipped with the latest GWF 4D technology.

Advantages

Besides the high measurement ratio that allows for a dynamic range between 0.02m³/h and 100m³/h at highest precision, the devices are extremely flexible when it comes to installation conditions. The utilitygrade IP68 design including the material selection result in highest product robustness. The technology allows for the device to be installed directly after or before 90° elbows, reducers or pumps. That allows highest possible flexibility in installations. Moreover the turn down ratio R1000 is guaranteed over the entire measurement range, far beyond the very basic MID requirements. Due to the clean and open contour flow tube, the measuring device has unparalleled low pressure loss over the device.

Applications

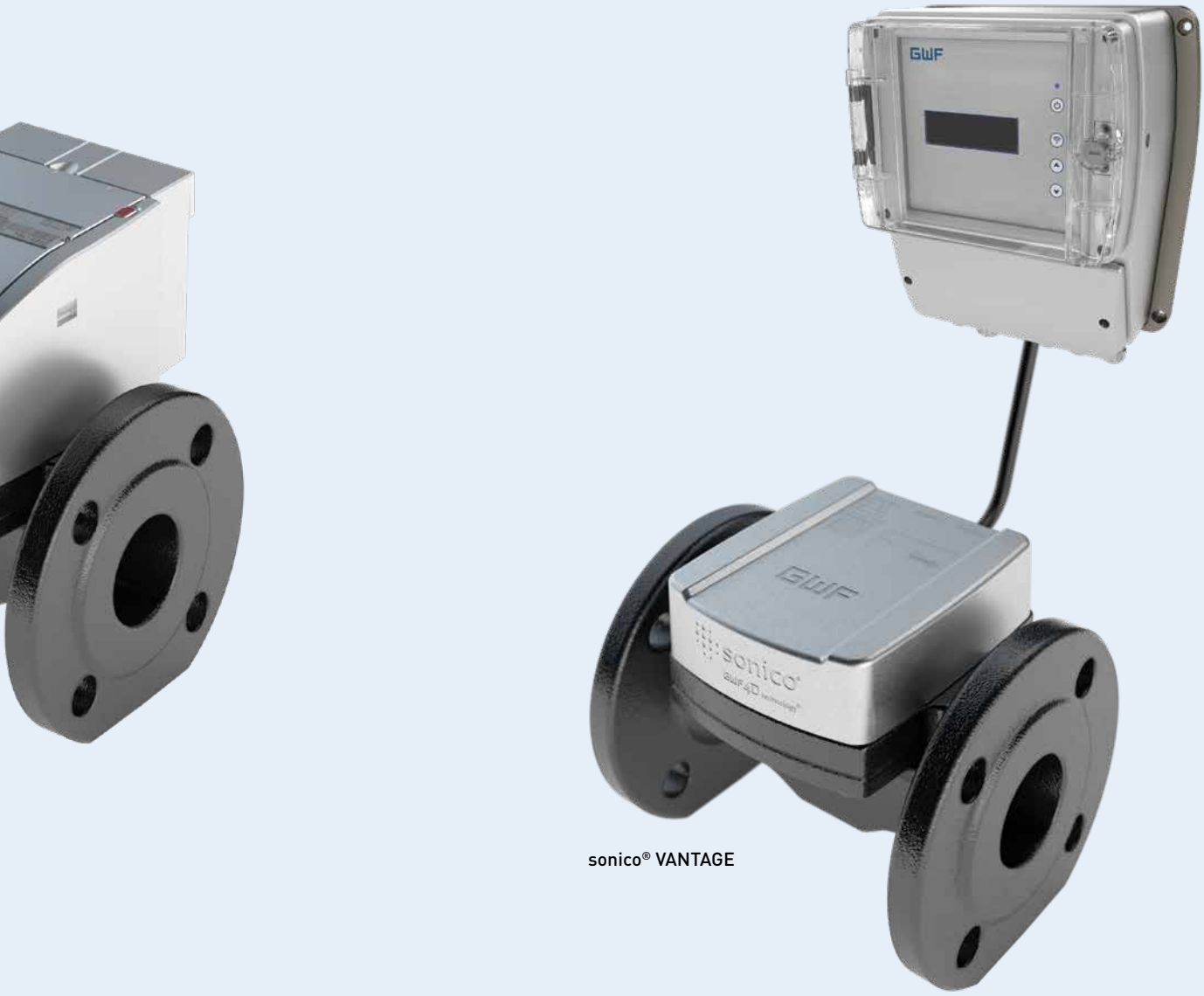
The devices are designed for measurement of potable, raw, and irrigation water in mains-powered process and grid installations. Typical users are industrial companies and utilities.

sonico® EDGE integrated model: Typically used at water reservoirs, water towers, water pumping stations.

sonico® VANTAGE external transmitter model: Typically used at water treatment plants – SCADA processing.

Further informations:

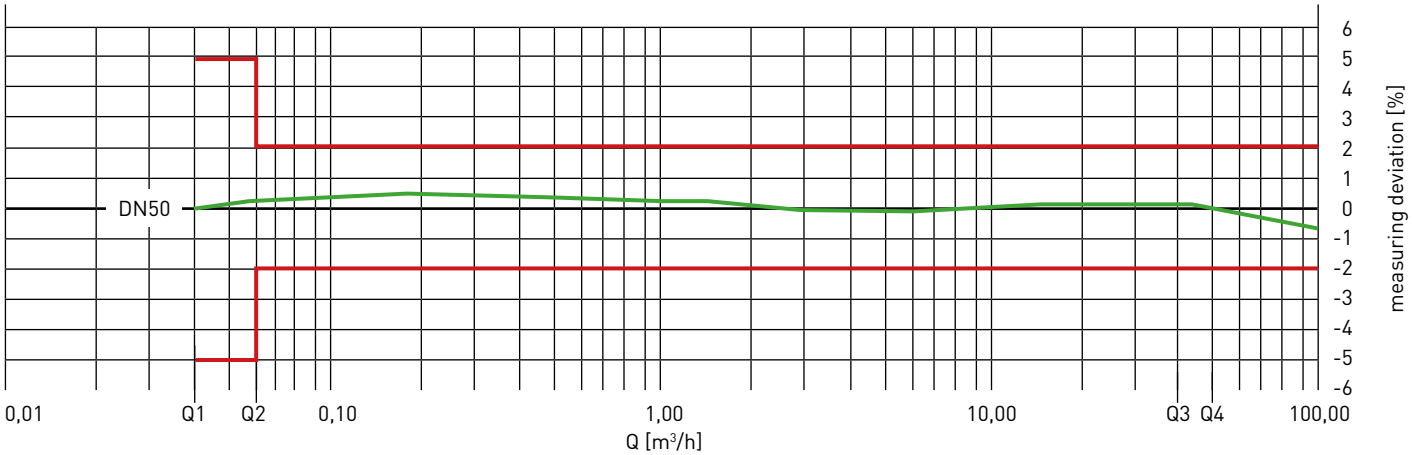
sonico® EDGE data sheet
sonico® VANTAGE data sheet



sonico® VANTAGE

4D technology measuring accuracy

4D technology measures a turn down ratio R1000 and is extremly robust to water turbulences caused by bends, reducers, valves or pumps. The time reverse acoustic principle enables a new level of measuring repeatability unaffected by flow perturbations, electromagnetic or grounding interference and water conductivity.



Production and quality system

sonico® EDGE DN50

sonico® EDGE DN100

GWF 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 – in limited numbers but highest quality. To manufacture the sonico® product line, GWF invested in a world leading production test bench 'LUZ1'. The test bench was installed in early 2018 as one of the most accurate production equipments in the world. Currently, the overall production and quality system is put in place to manufacture the sonico® product line for niche applications in the commercial and industrial domain.

Product launch

Currently field tests are ongoing in installations across the globe. Additional pilot installations with interested customers are being added over the next months. GWF will be taking orders for the sonico® product range as of Q3 2019 with delivery dates in Q1 2020.

Technology partnerships

As a medium sized company focused on niche markets and technology development, it is not part of GWF's strategy to invest further in production capacity. The scaling of GWF's 4D technology will be done through technology partnerships. GWF has a long standing reputation of working with world leading meter manufacturers in product design, component delivery and production setup.

sonico® EDGE DN150

sonico® EDGE DN300

GWF MessSysteme AG
Obergrundstrasse 119
6005 Lucerne, Switzerland

Bureau de la Suisse romande
GWF MessSysteme AG
Z.I. de la Vulpillière 61b
1070 Puidoux, Switzerland

Branch Kaufbeuren
GWF Technologies GmbH
Gewerbestraße 46f
87600 Kaufbeuren, Germany

Branch Hannover
GWF Labs GmbH
Bernd-Rosemeyer-Str. 10
30880 Laatzen, Germany

Branch Thessaloniki
GWF Labs IKE
Ganas & Ganas Building Complex
9th Km Thessaloniki-Thermi
57001 Thermi, Greece

Subject to modification, KIe10200, 01.12.2018

→ gwf.ch

printed in switzerland