ScioSense

UFM-02

Ultrasonic Flow Measurement for Sanitary Equipment

UFM-02 Ultrasonic Flow Measurement for Sanitary Equipment Application Note

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1. Introduction

Sanitary equipment such as electronic faucets and showers is increasingly defined by hygiene and smart functionality. End users now expect touchless operation and precise water control, features once reserved for premium products, while regulators and utilities place growing emphasis on water conservation and drinking water safety. For OEMs, meeting these expectations depends heavily on the quality and intelligence of the flow measurement at the heart of the device.

Despite these rising demands, low-cost mechanical flow meters remain widely used today. Their moving parts wear over time and their accuracy degrades, and they offer little or no digital integration. These constraints limit product lifetime and drive-up service costs, and they cap the value a manufacturer can build into the final product. As sanitary equipment becomes smarter and more connected, these limitations become an increasingly costly bottleneck.

The ScioSense UFM-02 ultrasonic flow module addresses this gap directly. Its non-contact ultrasonic measurement principle removes the wear, maintenance, and hygiene concerns of mechanical designs, while adding stable long-term accuracy, integrated leak detection, and a digital interface for smart functionality. In doing so, the UFM-02 enables manufacturers to upgrade their products and create measurable customer value over the full product lifetime.

2. Mechanical vs. Ultrasonic Flow Meter

Criterion	Mechanical Flow Meter	Ultrasonic Flow Meter (UFM-02)
Measurement Principle	Mechanical turbine / wheel	Ultrasonic, non-contact
Moving parts	Yes	No
Wear & lifetime	Wear over-time, limited lifetime	No wear, long lifetime
Accuracy over lifetime	Degrades with use	Stable and repeatable
Pressure loss	Present	None
Hygiene risk	Potential contamination	Excellent hygienic behaviour
Maintenance	Cleaning/ replacement required	Maintenance free
Digital interface	None or limited	Pulse & SPI, smart sensor
Leak detection	Not available	Integrated
Battery operation	Limited	Ultra-low power (~50 µA)
Total cost of ownership	Low initial, high lifetime cost	Optimized over product lifetime

3. Why Paying More Makes Economic Sense

Although ultrasonic flow meters have a higher initial unit cost than mechanical solutions, the overall economics strongly favor the UFM-02 when evaluated over the full product lifetime.

- No mechanical wear eliminates replacement and calibration costs
- Stable accuracy reduces warranty claims and customer complaints
- Leak detection helps prevent water damage and liability risks
- Digital interfaces enable premium features and product differentiation
- Long lifetime significantly reduces service and field failure costs

4. Target Customer Segments

The UFM-02 creates value across multiple sanitary equipment segments:

- Faucet and shower OEMs
  - Touchless operation, hygiene monitoring, smart water control
  - Certified drinking water safety, leak detection, lifetime stability
- Smart bathroom and connected sanitary systems
  - Digital data, IoT readiness, energy-efficient battery operation

5. Design & Integration Benefits

The compact design and flexible interfaces of the UFM-02 simplify integration into existing and new sanitary platforms while supporting modern product design trends.

- Small form factor enables compact and elegant designs
- Multiple thread sizes support various installations
- Pulse & SPI interface allows easy MCU integration
- Supports future software-based features and upgrades

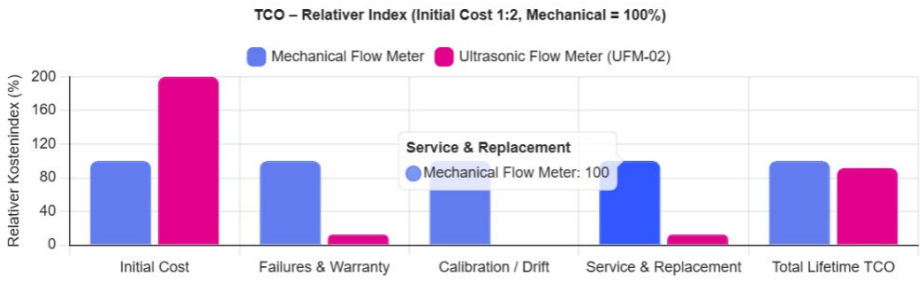
6. Typical Customer Application

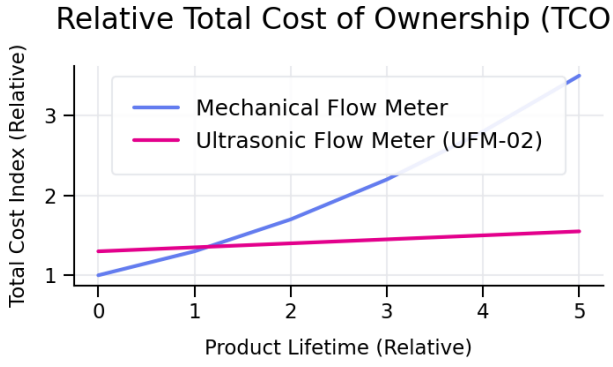
The pictures below describe typical smart sanitary equipment applications using the UFM-02 ultrasonic flow module:

- control of water consumption
- control the level of refills

7. Relative Total Cost of Ownership (TCO)

The diagram below illustrates the relative Total Cost of Ownership over the product lifetime. While mechanical flow meters benefit from a lower initial purchase price, their cumulative costs increase significantly due to wear, maintenance, calibration, and replacement. The UFM-02 ultrasonic flow module shows a clearly optimized cost profile over lifetime, making the higher initial investment economically advantageous.





8. Conclusion: A Smart Investment for Smart Sanitary Equipment

The ScioSense UFM-02 ultrasonic flow module enables OEMs and system integrators to upgrade traditional sanitary equipment systems into intelligent, connected and sustainable solutions. By replacing mechanical meters with ultrasonic technology, customers benefit from higher efficiency, lower operating costs and long-term reliability.

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Address: Sciosense B.V.
High Tech Campus 10
5656 AE Eindhoven
The Netherlands

Contact: www.sciosense.com
info@sciosense.com

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