ScioSense

UFM-02

Ultrasonic Flow Measurement in Premium Coffee Machines

PMT | PRECISION MEASUREMENT TECHNOLOGIES

UFM-02 Ultrasonic Flow Measurement in Premium Coffee Machines

Application Note

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Table of Contents

1. Introduction 3
2. UFM-02 highlights 3
3. Mechanical meter vs. ultrasonic flow meter 4
4. System integration into a coffee machine 4
5. Total cost of ownership advantage 5
6. Conclusion 5
Copyrights & Disclaimer 5

1. Introduction

In premium coffee machines, consistent beverage quality, low service requirements, and digital system integration are important product differentiators. While conventional mechanical flow meters can meet the needs of lower-cost designs, their moving parts can introduce wear, drift, and maintenance over time. Ultrasonic flow measurement offers a robust alternative: it enables precise, repeatable water dosing without moving parts, supports modern control architectures, and helps manufacturers design machines for long-term performance and lower lifetime cost.

2. UFM-02 highlights

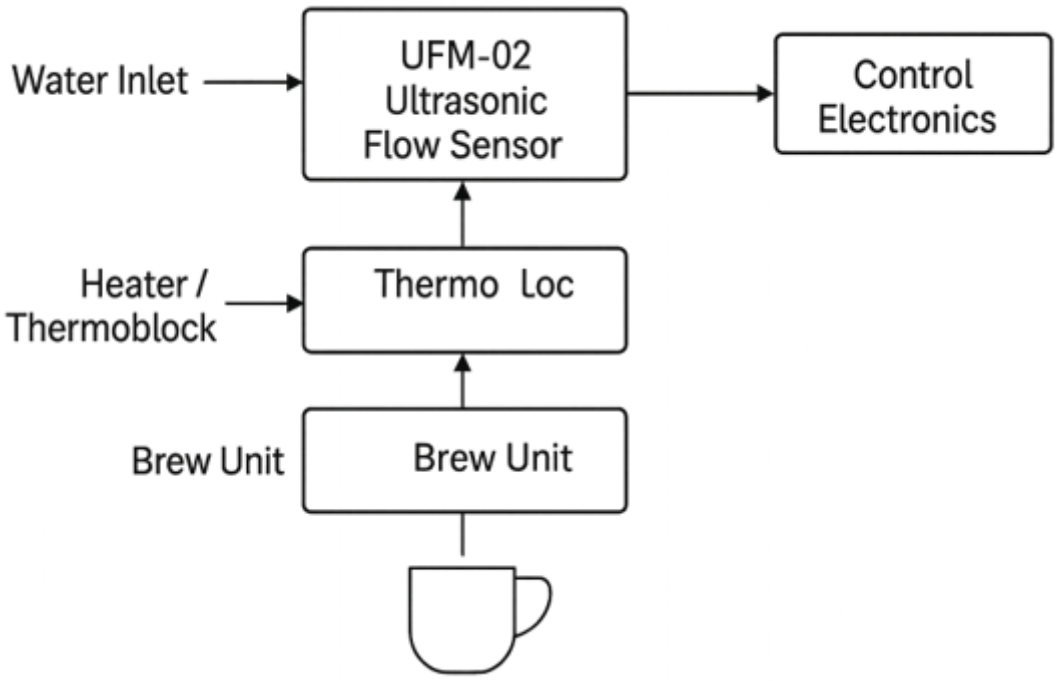
The UFM-02 is a compact ultrasonic water flow module based on time-of-flight measurement. Without moving parts, it provides stable, repeatable flow measurement over the entire lifetime of the coffee machine.

- Ultrasonic technology – no moving parts
- Flow range from 4 to 18,000 l/h
- Ultra-low power consumption (< 50 µA), ideal for battery-powered systems
- Excellent price/performance ratio for high-volume production
- Integrated temperature measurement
- Leak detection and diagnostics
- NSF61 certified – approved for drinking water applications
- Pulse and SPI interfaces, customization possible
- Designed for very long lifetime.

3. Mechanical meter vs. ultrasonic flow meter

Feature	Mechanical Flow Meter	UFM-02 Ultrasonic Flow Meter
Measurement Principle	Mechanical turbine / magnet	Ultrasonic time-of-flight
Moving parts	Yes – wear	No moving parts
Accuracy over lifetime	Degrades	Stable
Noise	Audible	Silent
Water quality sensitivity	Sensitive	Highly tolerant
Calibration	Required	Not required
Leak detection	Not possible	Integrated
Digital connectivity	Limited	Pulse / SPI
Lifetime	Limited	Appliance lifetime

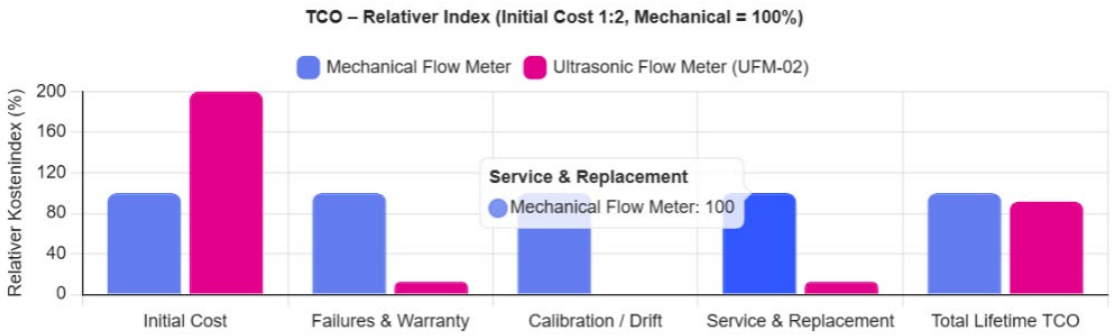
4. System integration into a coffee machine



Simplified block diagram of a premium coffee machine using the UFM-02 Ultrasonic Flow Module

5. Total cost of ownership advantage

Although an ultrasonic flow sensor typically carries a higher upfront component cost, the system-level economics can be more favorable over the full appliance lifetime. In mechanical flow meters, wear, drift, recalibration, and service replacement can add hidden costs in manufacturing, warranty handling, and field support. By eliminating moving parts and offering stable measurement over time, the UFM-02 helps reduce these downstream costs and can deliver a lower total cost of ownership in premium coffee machine platforms.



6. Conclusion

For mid- and high-end coffee machines, the ScioSense UFM-02 provides a compelling alternative to conventional mechanical flow meters. By combining non-contact ultrasonic measurement with digital interfaces and diagnostic capabilities, it helps improve dosing consistency, reduce wear-related service needs, and support long-term appliance performance. Although the initial component cost may be higher, the benefits in reliability, integration, and total cost of ownership make the UFM-02 a strong choice for premium machine designs.

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