

# Smart static flow meters using MSP430™ ultrasonic sensing microcontrollers



## Time to Market: Develop your solution within months rather than years of R&D

### High performance (measurement accuracy)

- High accuracy within  $<\pm 1\%$  of flow measurement
- Improved Zero-flow-drift measurements yielding higher dynamic range and support very low ( $<1$  liter/hr) flow-rates
- Excellent Single shot standard deviation measurement accuracy to eliminate need for higher measurement rates (eg: 8Hz) during normal operation, helps reduce overall system-level average current consumption ( $<3\mu\text{A}$  per measurement results)
- Immune to transducer variations with temperature and age

### Increased functionality to add differentiation

- Leak detection
- Bubble detection
- Freeze/Unfreeze detection with Alarm

### Cost effective (system level)

- Integrated AFE and gain amplifier to enable a truly single-chip SoC for water metering
- Ability to work with off-the-shelf low-cost transducers upto 2MHz
- Calibration supports customized temperature and flow-rates, reducing manufacturing costs

### Scalable platform

- Residential (DN15-25) and industrial pipe sizes (DN50 -DN1000) with Multiple transducer pair support
- Single platform for Water & Gas metering with Ultrasonic Analog Front-end (AFE) and Software Library with GUI
- Family of products from 32KB-256KB with 64,80,100 pin package

## Get started with Ultrasonic Sensing MCUs

<b>MCUs with Ultrasonic Sensing AFE</b>	<a href="#">MSP430FR6047</a> , <a href="#">MSP430FR6045</a> , <a href="#">MSP430FR6043</a> , <a href="#">MSP430FR5043</a> , <a href="#">MSP430FR6041</a> , <a href="#">MSP430FR5041</a>
<b>Evaluation kits</b>	EVM for Water Metering ( <a href="#">EVM430-FR6047</a> ), EVM for Gas Metering ( <a href="#">EVM430-FR6043</a> )
<b>Software</b>	<a href="#">Ultrasonic Design Center</a>
<b>Quick Start Guides</b>	Quick Start guide for developing <a href="#">Water Meters</a> , <a href="#">Gas Meters</a>
<b>TI Designs</b>	<ul style="list-style-type: none"> <li>• <a href="#">Ultrasonic Sensing Water Meter Front-End Reference Design(TIDM-1019)</a></li> <li>• <a href="#">Ultrasonic sensing subsystem reference design for gas flow measurement</a></li> <li>• <a href="#">Optimized ultrasonic sensing metrology reference design for water flow measurement (TIDM-02005)</a></li> <li>• <a href="#">Replacing platinum RTD sensors with digital temperature sensors reference design for Heat Meters(TIDA-010002)</a></li> </ul>
<b>Overview video</b>	<a href="http://www.ti.com/microcontrollers/msp430-ultra-low-power-mcus/ultrasonic-performance-sensing-mcus-overview.html#ultrasonic">http://www.ti.com/microcontrollers/msp430-ultra-low-power-mcus/ultrasonic-performance-sensing-mcus-overview.html#ultrasonic</a>
<b>Technical training</b>	<ul style="list-style-type: none"> <li>• <a href="#">Video Series : Ultrasonic Sensing for water flow meters</a></li> <li>• <a href="#">Video Series : Ultrasonic Sensing for gas flow meters</a></li> </ul>

Learn more at [www.ti.com/ultrasonicmcus](http://www.ti.com/ultrasonicmcus)

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