# Smart static flow meters using MSP430<sup>™</sup> ultrasonic sensing microcontrollers



# 🔱 TEXAS INSTRUMENTS

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

#### High performance (measurement accuracy)

- High accuracy within <±1% of flow measurement
- Improved Zero-flow-drift measurements yielding higher dynamic range and support very low (<1 liter/hr) flow-rates</li>
- 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 (<3uA 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

## **Get started with Ultrasonic Sensing MCUs**

### 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

MCUs with Ultrasonic Sensing AFE	MSP430FR6047, MSP430FR6045, MSP430FR6043, MSP430FR5043, MSP430FR6041, MSP430FR5041
Evaluation kits	EVM for Water Metering ( <u>EVM430-FR6047</u> ), EVM for Gas Metering ( <u>EVM430-FR6043</u> )
Software	Ultrasonic Design Center
Quick Start Guides	Quick Start guide for developing Water Meters, Gas Meters
TI Designs	<ul> <li>Ultrasonic Sensing Water Meter Front-End Reference Design(TIDM-1019)</li> <li>Ultrasonic sensing subsystem reference design for gas flow measurement</li> <li>Optimized ultrasonic sensing metrology reference design for water flow measurement (TIDM-02005)</li> <li>Replacing platinum RTD sensors with digital temperature sensors reference design for Heat Meters(TIDA-010002)</li> </ul>
Overview video	http://www.ti.com/microcontrollers/msp430-ultra-low-power-mcus/ultrasonic- performance-sensing-mcus-overview.html#ultrasonic
Technical training	<ul> <li><u>Video Series : Ultrasonic Sensing for water flow meters</u></li> <li><u>Video Series : Ultrasonic Sensing for gas flow meters</u></li> </ul>

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