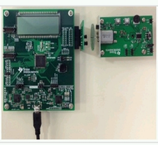
Water Meter Reference Design for two LC Sensors, Using Extended Scan Interface (ESI)

(ACTIVE) TIDM-LC-WATERMTR

Description & Features | Technical Documents | Support & Community | Order Now

View the Important Notice for TI Designs covering authorized use, intellectual property matters and disclaimers.



Fully assembled board (shown above) developed for testing and performance validation only, not available for sale.

Description

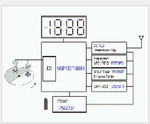
One of the challenges in battery operated water meters is to continuously measure the water flow information while consuming as little energy as possible. The EVM430-FR6989 used in this design features a MSP430 FRAM-based microcontroller with 100uA/MHz active-mode current, 450nA standby-mode current with the real-time clock enabled, and integrated low-power analog and digital peripherals. Additionally, the MCU offers for near infinite write endurance, quick/low-power writes, and data flexibility. This reference design demonstrates a usage example of the integrated Extended Scan Interface (ESI) on the microcontroller to achieve ultra-low power consumption compared with the same detecting methodology using an external circuit. In water meter designs, coupled to LC rotation detection sensor (provided), the ESI is continuously detecting the rotation of the propeller while the rest of the microcontroller is in a low-power mode. By using the ESI integrated in the MSP430 MCU, this design automates the measurement process and reduces CPU involvement, which helps to reduce overall power consumption

Features

- Supports 2 LC sensors for detecting rotation movement including rotating direction
- Ultra-low power consumption compared with external hardware solution
- GUI for setting up and calibrating the ESI
- Easy to install daughter sensor board for MCU target board
- Motor control board with variable speed to simulate flow using metal plate
- RF socket available to enable Low Power RF extension (Sub 1GHz or 2.4GHz ZigBee)

Schematic/Block Diagram

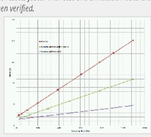
Quickly understand overall system functionality.



Download Schematic

Design Guide

Get results faster with test and simulation data that's been verified.



Download Design Guide

Design Files

Download ready-to-use system files to speed your design process. Get Viewer.

Download Design Files

Bill of Materials (BOM)

Find the complete list of components in this reference design.

Download BOM

TI Devices (5)

Order samples, get tools and find more information on the TI products in this reference design.

Part Number	Name	Product Family	Sample & Buy	Design Kits & Evaluation Modules
MSP430F5528	16-Bit Ultra-Low-Power Microcontroller, 128KB Flash, 8KB RAM, USB, 12bit ADC, 2 USCIs, 32bit HW MPY	Low Power + Performance	Sample & Buy	View Design Kits & Evaluation Modules
MSP430FR6989	MSP430FR6989 16 MHz ULP Microcontroller - 128 KB FRAM, 2KB SRAM, 83 IO, ADC12,	Ultra-low Power	Sample & Buy	View Design Kits & Evaluation

Show More

CAD/CAE symbols

Part #	Package | Pins	CAD File (.bxl)	STEP Model (.stp)
MSP430F5528	VQFN (RGC) | 64	Download	-
	DSBGA (YFF) | 64	Download	-
	BGA MICROSTAR JUNIOR (ZQE) | 80	Download	-
TPD2E001	SOP (DZD) | 4	Download	-
	SOT (DRL) | 5	Download	-
	WSON (DRS) | 6	Download	-
	USON (DRY) | 6	Download	-
TPS62237	USON (DRY) | 6	Download	-
TLV582046B	VQFN (RHB) | 32	Download	-
	LQFP (VF) | 32	Download	-

Texas Instruments and Accelerated Designs Inc. have collaborated together to provide TI customers with schematic symbols and PCB layout footprints for TI products.

Step 1: Download and install the Ultra Librarian software ZIP, 62MB

Step 2: Download the Symbol and Footprint .bxl file.

- read more -

Technical Documents

User Guides (1)

Title	Abstract	Type	Size (KB)	Date	Views
Gas or Water Meter With 2 LC Sensors Reference Design Guide		PDF	3054	25 Aug 2014	642

Design Files (5)

Title	Abstract	Type	Size (KB)	Date	Views
Water Meter Reference Design for Two LC Sensors, Using ESI Schematic		ZIP	562	25 Aug 2014	805
Water Meter Reference Design for Two LC Sensors, Using ESI PCB Layout		ZIP	318	25 Aug 2014	153
Water Meter Reference Design for Two LC Sensors, Using ESI CAD Files		ZIP	874	25 Aug 2014	186
Water Meter Reference Design for Two LC Sensors, Using ESI Bill of Materials		PDF	138	25 Aug 2014	202
Water Meter Reference Design for Two LC Sensors, Using ESI Gerber Files		ZIP	228	25 Aug 2014	121

Related Tools & Software

Software (1)

Water Meter Reference Design for Two LC Sensors, Using ESI Software
(ZIP, 4671 KB) 25 Aug 2014

Support & Community

TI E2E™ community

TI E2E™ Community

As a member of my.TI you can join the TI E2E™ Community where you can ask questions, share ideas and collaborate with fellow engineers and TI experts

Contents are provided "AS IS" by the respective TI and Community contributors and do not constitute TI specifications. See Terms of use.

Engage in the Community

- MSP430™ 16-bit Ultra Low Power MCUs
- C2000™ 32-bit Real Time MCUs
- Embedded Software
- Tiva™ C Series ARM® Cortex-M MCUs
- Hercules™ ARM® Cortex Safety MCUs
- Development Tools

Wikis

Visit the TI Wiki

Videos

Flow Meter ref design using the world's lowest-power MCU

In a battery-operated water meter, long battery life is the key. One of the challenges is to continuously measure the water flow information while consuming the least energy possible. The Extended Scan Interface (ESI) senses

Posted: 17-Aug-2014
Duration: 5:55
Views: 1791
Tags: flow meter, msp430fr6989, water meter, smart grid, msp430

Evaluate today!

Related Videos

Flow Meter ref design using the world's lowest-power MCU

FlowESI GUI — A tool to jumpstart your flow meter design!

Your History

Products You Recently Viewed

- TIDC-SMARTPLUG-WIFI
- TIDA-00131
- TIDM-TWOPHASEMETER-I2040
- PMP9464
- TIDM-LPBP-CONTACTLESS-TEMP-SENSE

TI is a global semiconductor design and manufacturing company, innovate with 100,000+ analog ICs and embedded processors, along with software, tools and the industry's largest sales/support staff.

© Copyright 1995-2014 Texas Instruments Incorporated. All rights reserved.
Trademarks | Privacy policy | Terms of use | Terms of sale