MCF51MM256

Measurement engine demo using MQX™ RTOS

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Get to Know the TWR-MCF51MM-KIT

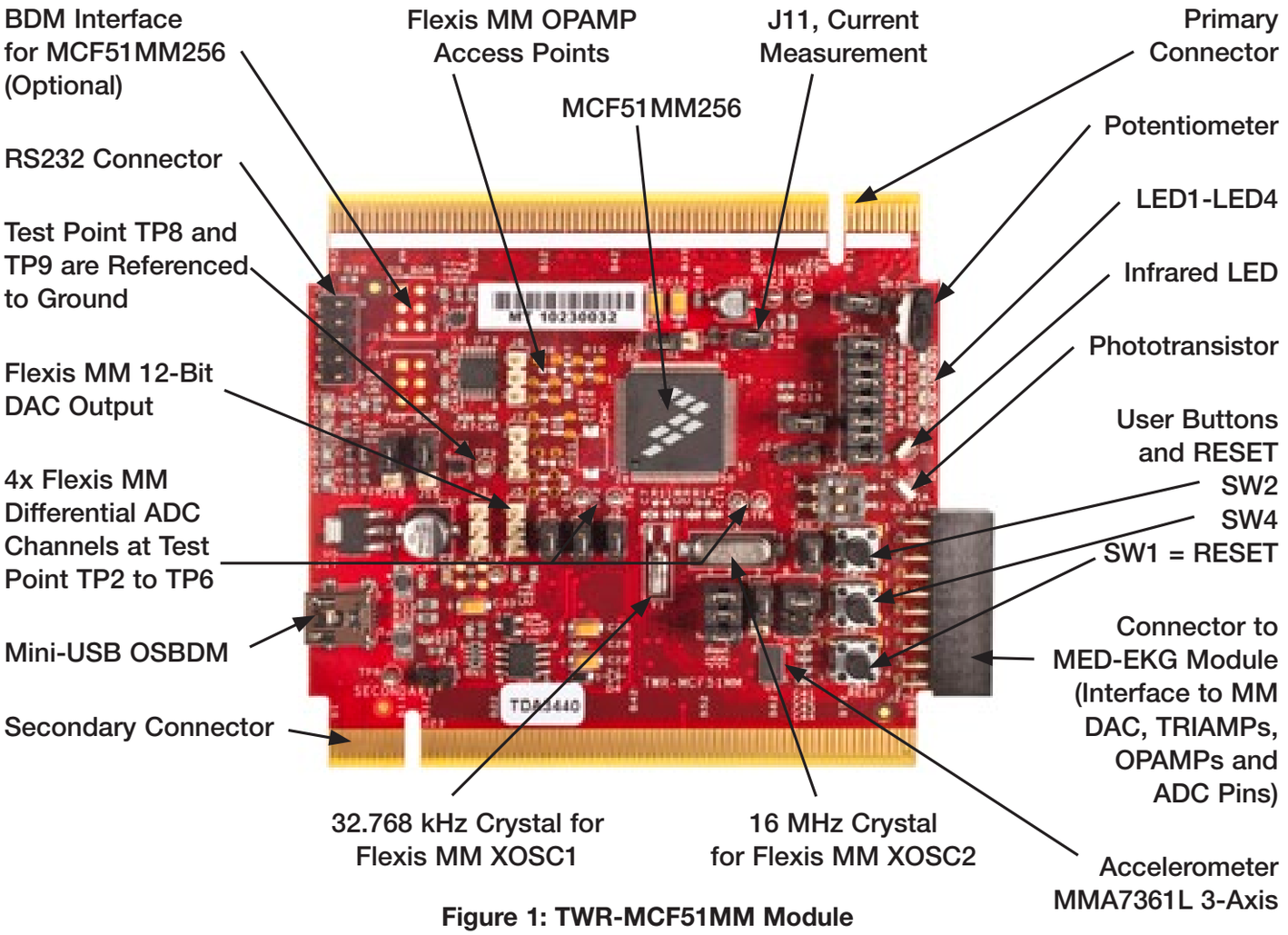
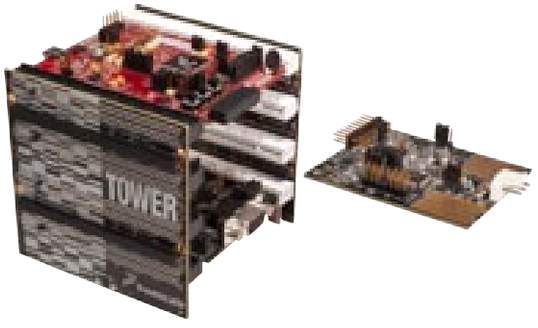


Figure 1: TWR-MCF51MM Module



TWR-MCF51MM-KIT
Freescale Tower System

The TWR-MCF51MM module is part of the Freescale Tower System, a modular development platform that enables rapid prototyping and tool re-use through reconfigurable hardware. Take your design to the next level and begin constructing your Tower System today.

Introduction

This lab demonstrates the use of the MQX™ RTOS via the same measurement engine demo found in Lab 3.

MQX RTOS is a complimentary solution offered by Freescale. MQX RTOS offers a straightforward API with a modular architecture, making it simple to fine tune and scalable to fit a customer's RTOS needs. MQX RTOS is intended for 32-bit devices including MCF51MM256 and does not support the 8-bit MC9S08MM.

Required Material

- Use the same materials that are required for Lab 3 except use LAB4.zip instead of LAB3.zip. The file is located in the "Software" tab, under the "Labs" section on your DVD.
- An additional RS232 cable (not provided)—the Serial Grapher display is sent via the UART RS232 port from the TWR-SER instead of the USB. This is different than it is in Lab 3.
- If you do not have a serial port on your PC, you may need to purchase a serial to USB port cable

This lab demonstrates

- MQX project running in CodeWarrior IDE
- MQX GPIO driver

NOTE: Please install MQX RTOS 3.6 from this DVD. Then download MQX RTOS 3.6.1 (required for MCF51MM256) at **freescale.com/mqx** under the download section. You can run Lab 4 without installing MQX RTOS.

The following lab assumes the user has loaded the DVD at f:\ and has extracted all zipped files under working folder d:\work. Please replace the path if your environment is different.

LAB 4

Step-by-Step Guide

Configuring the Hardware

1. Configure the TWR-SER module for RS232 mode by connecting pin 1 and pin 2 of the following jumper headers: SER_SEL (J15), TXD_SEL (J19), and RXD_SL (J17).
2. Build the same Lab 3 hardware configuration. Disregard the multimeter connections mentioned in Lab 3.

Connecting to the Computer

3. Make the same connections mentioned in Lab 3 under Connecting to the Computer.
4. Connect the serial port on TWR-SER module to a serial port on your PC.

Programming the MCF51MM256

5. Open CodeWarrior 6.3, unzip file LAB4.zip located in the “Software” tab, under the “Labs” section on the DVD into d:\work and open the lab project by selecting File > Open. Then select d:\work\LAB4\Freescale MQX 3.6\demo\ medical_engine_sci\cwmcu63\ medical_ engine_sci_twrmcf51mm.mcp.
6. Click on the  Debug icon on the project panel toolbar. Click OK to the pop-up message to continue programming the internal flash of MCF51MM256. Close the debugger window and press the RESET button on the TWR-MCF51MM.

Running the Measurement Engine Demo using MQX RTOS

7. Run Start menu > Programs > P&E Embedded Multilink Toolkit > Utilities > Serial Grapher Utility. Select COM1, baud rate at 115200 and click

   "Open Serial Port and Start Demo."

8. Press any key from your keyboard to start the demo. The default state sends the non-amplified sine wave to the Serial Grapher as referenced in Lab 3 Demo 6, and the user is able to switch to sending the amplified sine wave as referenced in Lab 3 Demo 7. SW4 on the TWR-MCF51MM module can be used to switch back and forth between these two states.
9. Follow the same steps in Lab 3 to measure the signals on the TWR-MCF51MM. Note that the sine wave frequency is 2 kHz in Lab 4 instead of 20 kHz in Lab 3.

Note: Do not mistake the low resolution of sine wave generation as the actual 12-bit DAC resolution. Both sine waveforms in Lab 3 and Lab 4 are constructed only with 16 data points. For a better resolution, you can plug more points in the look up table in your own project.

10. Press SW2 from TWR-MCF51MM to quit the demo.

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To learn more about the **TWR-MCF51MM-KIT** and other Freescale medical products, please visit **freescale.com/mcf51mm**, **freescale.com/medical** and **freescale.com/tower.**

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