D437 Demo Board

This D437 demo board running D437_3.c demonstrates the MSP430F437 driving a 3½ digit static LCD display with its integrated LCD driver with ultralow current consumption, temperature measurement with its integrated temperature diode and analog voltage measurement with 1mV resolution using the integrated 12-bit A/D converter.

Three push buttons allow the user to select between these modes at any point of time. On power-up the ultralow power real-time clock mode is set by default.

Clock mode: The time is displayed in "hh:mm" format. While in this mode if the clock mode button is pressed "m:ss" is displayed. Keeping this button pressed also allows the user to set the time. To set hours keep pressed the 'Temperature mode' button while the 'Clock mode' is pressed and to set minutes keep Millivolt mode' button while the 'Clock mode' is pressed. Releasing the 'Clock mode' button reverts the display to "hh:mm" from "m:ss"

Temperature mode: The ambient temperature is displayed. Since the temperature sensor is integrated the whole chip acts as the sensor mass. Change in temperature can be observed by touching the MSP430 with a finger. When the temperature is above 80 deg F the on board LED lights up and goes off when the temperature falls below 80 deg F.

Millivolt mode: The potentiometer wiper output analog voltage is measured and displayed with 1 millivolt resolution. The potentiometer scans the whole range of measurement. Gently rotate the potentiometer to observe changes.

Reference Cal mode: To enter 'Cal' mode, insert the power jumper with 'mV' button pressed. Now pressing the 'mV' button takes you to 'Cal' mode. Using this mode you can calibrate the ADC12 Vref for accuracy. Move the potentiometer wiper to max. position and measure the voltage between the wiper and ground with a known accurate milli-voltmeter. Use the 'Clock' and 'Temperature' buttons to increment and decrement the displayed value to match the known meter. At this point the Vref is calibrated. Please press the 'mV' button for 1 second to burn the cal values in flash to have them stored permanently. Your demo board is now calibrated !

Note: The Clock mode demonstrates the ultralow power operation of the MSP430. The clock runs with < 2.5 microamperes average current. This yields 10 year battery life for the CR2032 3V battery when the demo is continuously ON in this mode.

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