Meet the MSP430FR4133 LaunchPad Development Kit

Part Number: MSP-EXP430FR4133

BoosterPack Ecosystem

Sharp® Memory LCD BoosterPack
- 1.3" 96 x 96 pixel LCD (LS013B4DN04)
- 2 capacitive touch sliders
- DC/DC stepper for 5V displays
- Ultra-low-power operation

Sub-GHz RF BoosterPack
- CC110L RF transceiver
- Great RF range!
- Includes 2x RF BoosterPacks
- Prototyping area
- Send & Receive RF data easily

Only $19

» See them all @ ti.com/boosterpacks

Software Tools

Energia
A simple open-source & community-driven code editor.

Easy-to-use functions for blinking LEDs, buzzing buzzers & sensing sensors.

>> www.energia.nu

www.ti.com/ccs

Code Composer Studio™ IDE

Professional Software tools
LaunchPad is also supported by professional IDEs that provide industrial-grade features and full debug-capability. Set breakpoints, watch variables & more with LaunchPad.

www.ti.com/iar

IAR Embedded Workbench ®

Resources
ti.com/launchpad

- Code examples
- Open Source Design Files
- Documentation
- Example projects
- Videos
- Tutorials
- Other TI products

Below are the pins exposed @ the BoosterPack connector.

Also shown are functions that map with the BoosterPack standard.

* Note that to comply with the I2C channels of the BoosterPack standard, a software-emulated I2C must be used.

** Some LaunchPads do not 100% comply with the standard, please check your LaunchPad to ensure compatability

(!) Denotes I/O pins that are interrupt-capable.

A closer look at your new LaunchPad Development Kit

Featured microcontroller: MSP430FR4133

This LaunchPad is great for...

- Battery-operated LCD applications enabled by the ultra-low-power FRAM as well as the integrated LCD driver and charge pump of the MSP430FR4133
- Space constrained applications where abundant IO pins, flexible LCD pin configuration, and integrated smart analog and digital peripherals can save board space and simplify layout
- Remote control applications made easier with enhanced IR modulation

What comes in the box?

MSP-EXP430FR4133 LaunchPad

eZ-FET on-board emulator
Enables programming, debugging & application UART via USB.

Featuring EnergyTrace™ technology, enabling power-aware debugging

This Quick Start Guide


Micro-USB Cable


Software @ ti.com/msp-exp430fr4133

MSP430FR4133 Microcontroller
- 16 MHz CPU
- 16 kB Embedded FRAM
- Liquid Crystal Display (LCD)
  - LCD support up to 8 x 32 segment
  - On-chip charge pump
  - LCD pins configurable as SEG or COM
- 2 x 16-bit timers, 1 x 16-bit Low-Power Counter (LPC)
- 16-bit Cyclic Redundancy Checker (CRC)
- 10-channel 10-bit Analog-to-Digital Converter (ADC)
- 200ksps + Internal Reference
- Serial communication module (eUSCI)
  - UART, SPI, I2C
  - IrDA enhanced IR Modulation

Out-of-box Demo

Find more information @ ti.com/msp-exp430fr4133

1. Connecting to the computer
Connect the LaunchPad using the included USB cable to a computer. A green power LED should illuminate. For proper operation, drivers are needed. It is recommended to get drivers by installing an IDE such as TI's CCS or IAR EW430. Drivers are also available at ti.com/MSPdrivers.

2. Running the Out-of-box Demo
When connected to your computer, the LaunchPad will power up and display a greeting message on the LCD. Press and hold the S1 and S2 buttons simultaneously to select a new mode.

Stopwatch Mode
This mode provides a simple stopwatch application. It supports split time, where the display freezes while the stopwatch continues running in the background.

Timer Stopped:
S1 - Start time
S2 - Reset time
Timer Running:
S1 - Stop time
S2 - Split time (lap time)

Temperature Mode
This mode provides a simple thermometer application. Using the on-chip temperature sensor, the temperature is displayed on the LCD.

S1 - Pause current temperature
S2 - Toggle temperature between °F/C

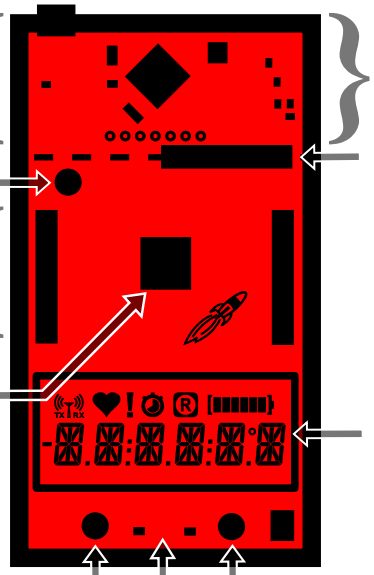
MSP-EXP430FR4133 Overview

eZ-FET on-board emulator
Enables debugging/programming as well as communication back to the PC. The eZ-FET can also provide power to the target MCU.

Reset

20-pin BoosterPack plug-in module connector
(J1 & J2)

MSP430FR4133 Microcontroller
MSP1



Introducing EnergyTrace Technology
Real-time power consumption readings & state updates from the MSP430FR4133 MCU, including CPU and peripheral state are viewable through the EnergyTrace GUI

Jumpers to isolate emulator from target MCU (J101)
- Back-channel UART to PC (RTS, CTS, RXD, TXD)
- Spy-bi-wire debug (SBWTDIO/SBWTCK)
- Power (5V, 3V3, & GND)

Segmented LCD Display
- 6 alphanumeric characters
- 6 symbols for various applicaions
- Ultra-low power display

Button/Switch S1

User LEDs LED1 & LED2

Button/Switch S2

EnergyTrace™ Technology

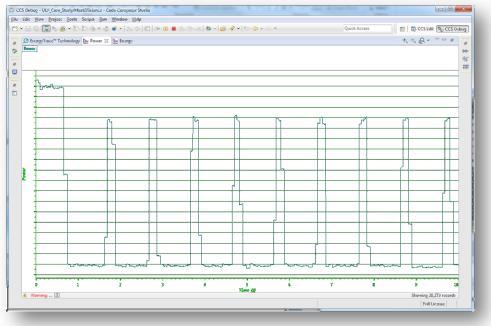
Find more information @ ti.com/EnergyTrace

EnergyTrace technology implements a new method for measuring MCU current consumption. EnergyTrace uses a DC-DC solution to measure the time density of charge pulses. The EnergyTrace technology window allows users to view power data and compare power consumption! This makes optimizing the power consumption of an application easier than ever before!

EnergyTrace Profile
EnergyTrace Profile runtime and energy data for low power modes along with each function run during Active Mode.

Graphical Power Data
These two tabs of the EnergyTrace Technology window show a graph over time of power and energy.

Enable EnergyTrace Technology Window
1. Download CCS version 6.0 and newer
   - ti.com/ccs
2. Enable EnergyTrace Technology Window
   - In CCS, click: Window>> Preferences >> Code Composer Studio >> Advanced Tools >> EnergyTrace Technology
   - Check "Enable" box
3. Debug your application to launch EnergyTrace Window



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