Meet the Hercules™ RM46x LaunchPad Development Kit

Part Number: LAUNCHXL2-RM46

Resources
ti.com/launchpad

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

BoosterPack Ecosystem

Sensor Hub BoosterPack
- InvenSense MPU-9150 9-axis MEMS motion sensor
  - 3-axis gyroscope
  - 3-axis accelerometer
  - 3-axis compass
- Bosch Sensortec BMP180 pressure sensor
- Sensirion SHT32 humidity & ambient temperature sensor
- Intersil ISL29023 light & IR

DRV8301 Motor Driver BoosterPack
- Spin Any Three Phase Motor!
- 6-24V Supply Input
- 10A Continuous/14A Peak

>> See them all @ ti.com/boosterpacks

Software Tools

HALCoGEN
A powerful GUI based code generation tool that allows users to configure peripherals and other MCU parameters.

Easily import code into CCS and other IDEs.
www.ti.com/tool/halcogen

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.

Code Composer Studio™ IDE
www.ti.com/ccs

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Below are the pins exposed @ the 2x BoosterPack connector sites.

Mapping to the booster pack standard is shown. In some cases a function can be either a GIO or another function, and may be listed twice (color coded as both GIO and again as the function). Additional functions beyond the booster pack standard may be available. For details consult the launchpad schematic.

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

When using some BoosterPacks, JP2,3,4, or 5 may need to be removed. For example, using this LaunchPad with BoosterPack BOOSTXL-DRV8301 that includes a 3.3V regulator. To avoid conflict between the LaunchPad's 3.3V regulator and the regulator on the BoosterPack, JP2 (or JP4) should be removed.

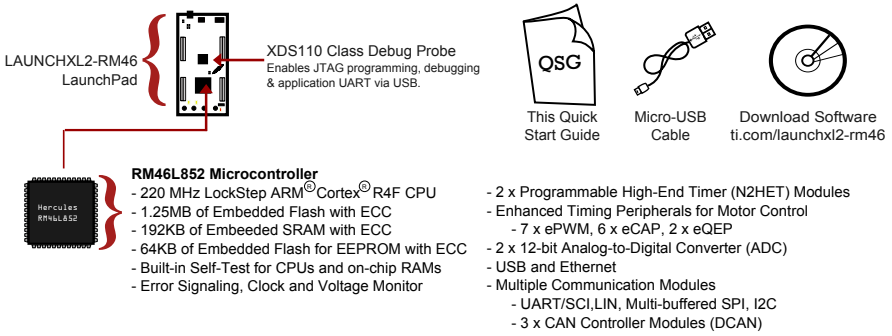
A closer look at your new LaunchPad Development Kit

Featured microcontroller: Hercules RM46L852

This LaunchPad is great for...

- Starting evaluation with Hercules RM MCUs designed for IEC61508 functional safety industrial and medical applications.
- Getting hands-on experience with the MCU's hardware integrated safety and diagnostic features.
- Getting familiar with SafeTI software and development tools that ease development of functional safety applications.

What comes in the box?



RM46L852 Microcontroller

- 220 MHz LockStep ARM® Cortex® R4F CPU
- 1.25MB of Embedded Flash with ECC
- 192KB of Embeeded SRAM with ECC
- 64KB of Embedded Flash for EEPROM with ECC
- Built-in Self-Test for CPUs and on-chip RAMs
- Error Signaling, Clock and Voltage Monitor
- 2 x Programmable High-End Timer (N2HET) Modules
- Enhanced Timing Peripherals for Motor Control
  - 7 x ePWM, 6 x eCAP, 2 x eQEP
- 2 x 12-bit Analog-to-Digital Converter (ADC)
- USB and Ethernet
- Multiple Communication Modules
  - UART/SCI,LIN, Multi-buffered SPI, I2C
  - 3 x CAN Controller Modules (DCAN)

Out-of-box Demo

Find more information @ ti.com/launchxl2-rm46

1. (Optional) Installing Code Composer Studio (CCS)
The virtual COM port drivers that are required to see the console output of the out of box demo are bundled with CCS. If you wish to see this part of the demo, install CCS v6.0.1 or later before connecting the LaunchPad to the PC.

2. Connecting to a Computer and Powering the LaunchPad
The LaunchPad is configured by default to be USB powered (JP6 must be installed), which can be done by connecting the LaunchPad to a computer using the included USB cable. If you skipped the optional step 1, ignore any error/warning messages about missing drivers during this step.

3. (Optional) Opening a Terminal Program
If you completed step 1 and wish to see the console output of the demo, this is the time to configure the terminal program of your choice:
> Select COM port identified as "XDS Class Application/User UART" from your computer's device manager.
> Configure Baud Rate: 19200, Data Bits: 8, Stop Bits: 2 and Parity: None.

4. Running the Out-of-box Demo
This LaunchPad comes pre-programmed with a demo set that highlights several of MCU's safety features. When powered the LaunchPad will start blinking USER LEDs.

Demo 1: An on-board Ambient Light Sensor is connected to the MCU's Analog Input 1. The USER LED B blinks according to the light intensity and a change in light intensity will cause it to blink faster or slower.

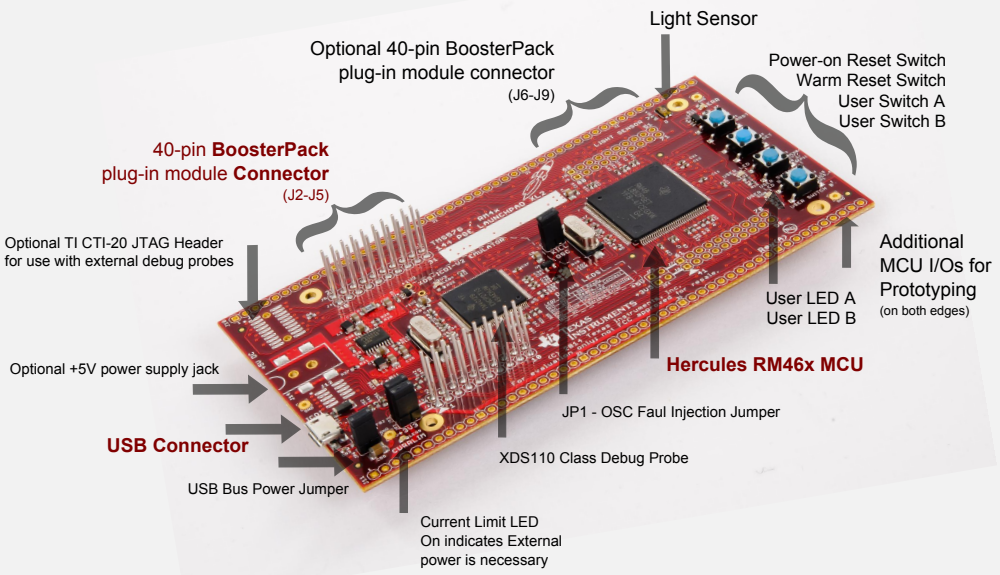
Demo 2: Shorting jumper JP1 will short the OSC to GND and cause an Oscillator Fault in the MCU. The on-chip monitor will detect and trigger an error singal causing the ERR LED to light up. **Note:** JP1 should be open during normal operation.

Demo 3: The push-button USER SWITCH B will inject a core compare error (CPU mismatch). An on-chip monitor will detect the fault and trigger an error signal causing the ERR LED to light up.

Demo 4: The push-button USER SWITCH A will inject a single bit error in the MCU's flash on every push. ECC logic corrects single bit errors in flash and counts them. The USER LED A blinks faster with every error detected. When a pre-programmed limit (6) is reached, the error signal is triggered and the ERR LED lights up.

When you are ready to take the next step, complete *Project 0*. For more information go to www.ti.com/launchpad and click on the Project 0 link for Hercules RM46x LaunchPad.

LAUNCHXL2-RM46 Overview



SafeTI™ Design Packages for Functional Safety

Find more information @ ti.com/safeti

SafeTI™ design packages help designers meet industry standard functional safety requirements while managing both systematic and random failures. Using SafeTI components helps make it easier for designers to achieve applicable end-product certification and get to market quickly with their safety critical systems which are pervasive in our world today.

- Complementary embedded processing and analog products that work together to help designer meet safety standards
- Safety development process certified suitable for use in development of IEC61508 and ISO26262 compliant semiconductors
- Safety related documentation: *Safety Analysis Report, Safety Manual and Safety Report*
- Safety Tools and Software (See below)

SafeTI Diagnostic Library

Software library of functions and response handlers for various safety features of the Hercules Safety MCUs.
Download: ti.com/tool/safeti_diag_lib

SafeTI Compiler Qualification Kit

Assists developers in qualifying their use of the TI ARM Compiler to functional safety standards such as IEC 61508 and ISO 26262.
Learn more: ti.com/tool/safeti_cqkit

SafeTI Compliance Support Packages

SafeTI Compliance Support Packages for HALCoGen and SafeTI Diagnostic Library provide the necessary documentation, reports and unit test capability to assist developers who need to comply with functional safety standards such as ISO 26262 and IEC 61508.

TI E2E™ Community

Hercules MCU E2E Support Forum:
>> ti.com/hercules-support

Hercules Training Videos:
>> ti.com/herculestraining

SPNU610

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