



# Quick Start Guide for the Freescale Freedom Development Platform

## FRDM-KL43Z



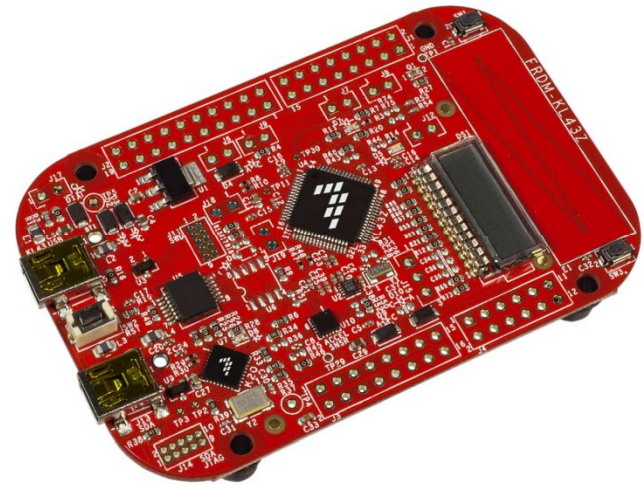
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# Quick Start Package Overview

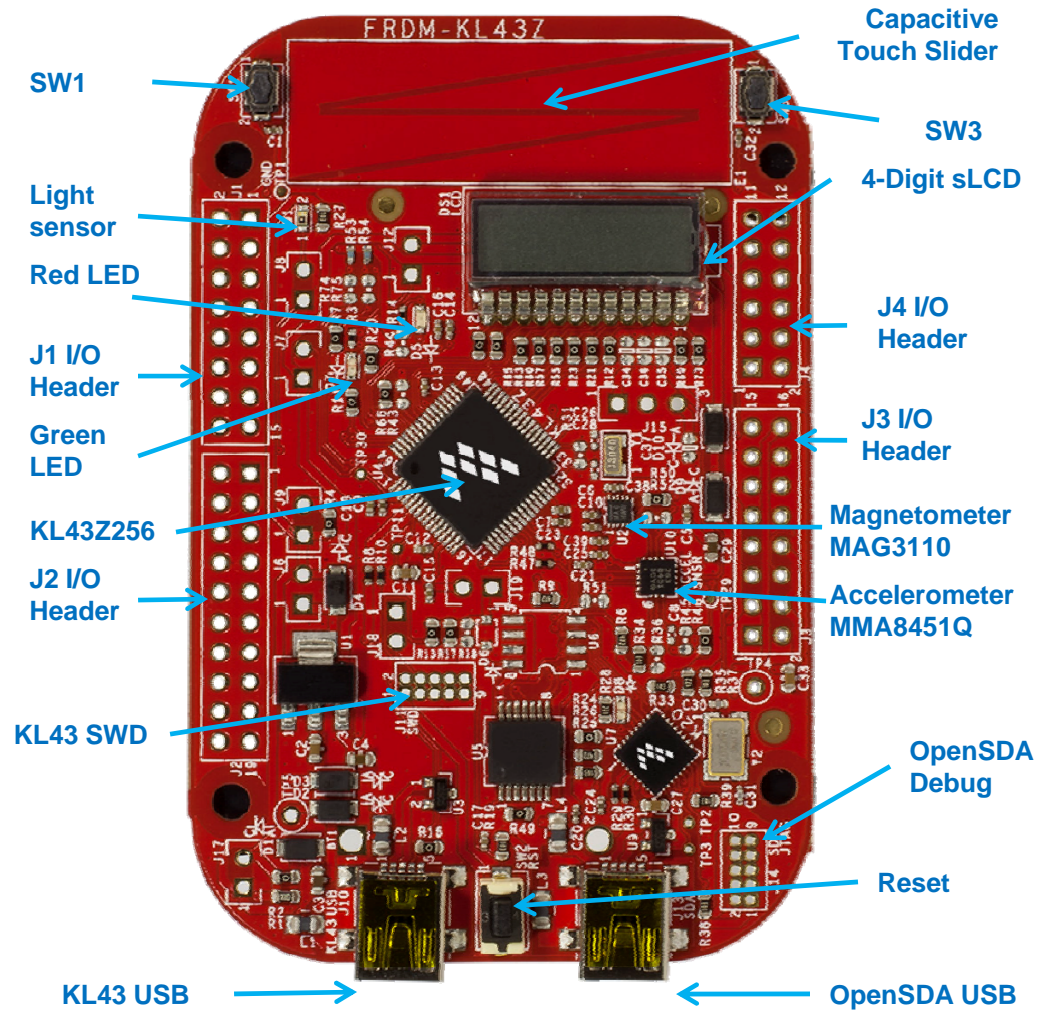
These documents are available as part of the Quick Start Package:

Name	Type	Description
Quick Start Guide	PDF	This document
OpenSDA Applications	Folder	OpenSDA Applications for the FRDM-KL43Z
Precompiled Examples	Folder	S-record images of example projects for use with the MSD Flash Programmer

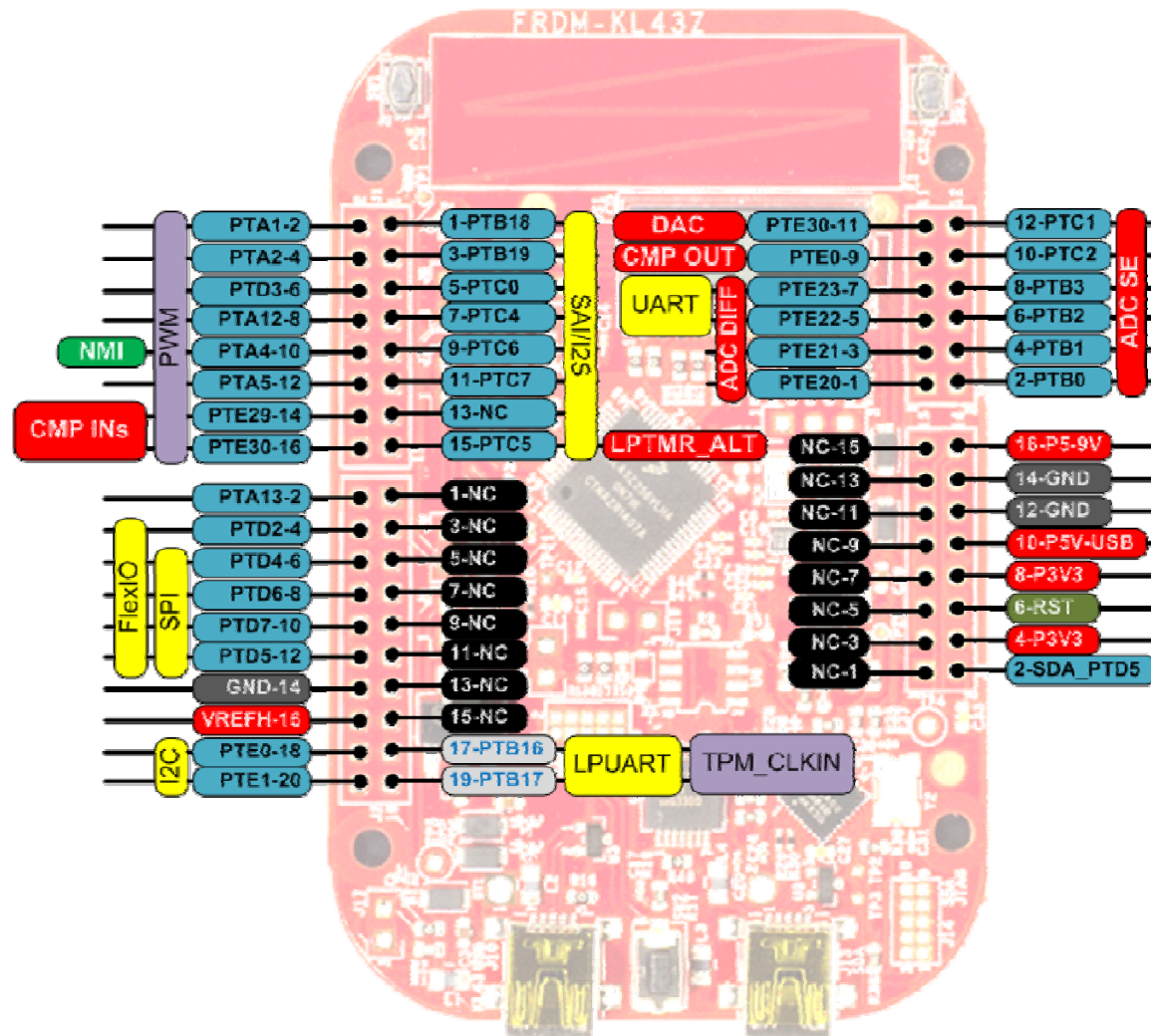
Additional reference documents are available on [freescale.com/FRDM-KL43Z](https://www.freescale.com/FRDM-KL43Z):

Name	Description
FRDM-KL43Z Quick Start Package	Quick Start Guide and supporting files for getting started with the FRDM-KL43Z
FRDM-KL43Z User's Manual	Overview and detailed information for the FRDM-KL43Z hardware
FRDM-KL43Z Pin-outs	Spreadsheet of pin connections for all MCU pins. Includes pin out for the I/O headers, Arduino R3 compatibility chart, and OpenSDA MCU pin out.
FRDM-KL43Z Schematics	PDF schematics for the FRDM-KL43Z hardware
FRDM-KL43Z Design Package	Zip file containing all design source files for the FRDM-KL43Z hardware
OpenSDA User's Guide	Overview and instructions for use of the OpenSDA embedded debug circuit

# Get to Know the FRDM-KL43Z



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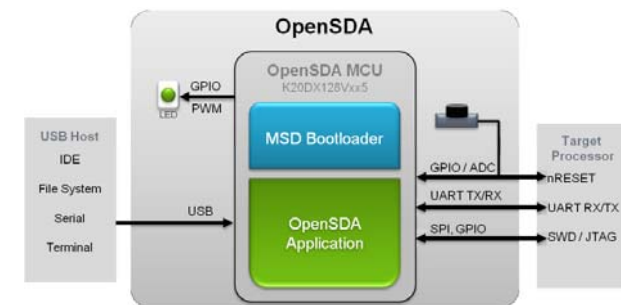
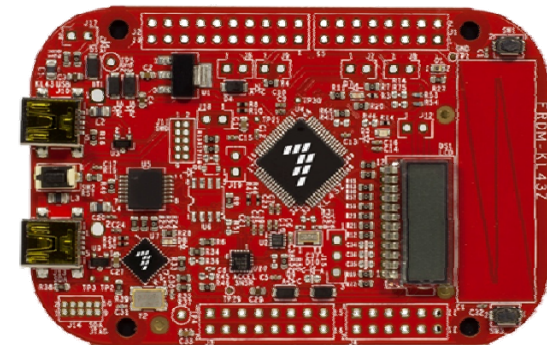


# Get to Know the FRDM-KL43Z

The Freescale Freedom development platform is a set of software and hardware tools for evaluation and development. It is ideal for rapid prototyping of microcontroller-based applications. The Freescale Freedom KL43Z hardware (FRDM-KL43Z) is a simple, yet sophisticated design featuring a Kinetis L series microcontroller, the industry's first microcontroller built on the ARM® Cortex®-M0+ core.

## Features:

- MKL43Z256VLH4MCU – 48MHz, 256KB Flash, 32KB SRAM, 16K ROM (Kibble), segment LCD, USB device (FS), 64 LQFP
- Capacitive touch slider, MMA8451Q accelerometer, MAG3110 magnetometer.
- Flexible power supply options – USB, coin cell battery, external source
- Easy access to MCU I/O
- Battery-ready, power-measurement access points
- Form factor compatible with Arduino™ R3 pin layout
- OpenSDA debug interface
- Mass storage device flash programming interface (default) – no tool installation required to evaluate demo apps
- P&E Debug interface provides run-control debugging and compatibility with IDE tools
- CMSIS-DAP interface: new ARM standard for embedded debug interface Refer to the FRDM-KL43Z User's Manual and OpenSDA User's Guide for more information.



# Getting Started Out of the Box

## Installing Drivers and Running the Out of Box Demo

**0** **Optional: Download and Install the P&E OpenSDA USB Drivers found at [www.pemicro.com/opensda](http://www.pemicro.com/opensda).**

**1** Plug in a USB cable (not included) from a USB host to the OpenSDA mini-B USB connector. The FRDM-KL43Z will be powered by this USB connection.

FRDM-KL43Z comes with the mass-storage device (MSD) Flash Programmer OpenSDA Application pre-installed. It will appear as a removable storage drive with a volume label of FRDM-KL43Z.

The MSD Flash Programmer also includes a USB virtual serial port which requires an .INF file for proper installation in Windows. The necessary .INF file is available in the P&E OpenSDA USB Drivers (Step 0) and also on the FRDM-KL43Z removable drive.

If the USB CDC Serial Port fails to automatically install in Windows, follow the instructions in Step 2. Otherwise, skip to Step 3.

- 2**
1. [Open Device Manager](#)
  2. Locate and right-click on “OpenSDA – CDC Serial Port”
  3. Select “Update Driver Software”
  4. “Browse” and select the FRDM-KL43Z drive
  5. Click “Next” to complete the installation

**3** The pre-installed demo running on the KL43 MCU shows different features of the board including segment LCD, UART, accelerometer, RTC, TPM/PWM, ADC, light sensor etc.

# Introduction to OpenSDA

The MSD Flash Programmer is a composite USB application that provides a virtual serial port and an easy and convenient way to program applications into the KL43Z MCU. It emulates a FAT16 file system, appearing as a removable drive in the host file system with a volume label of FRDM-KL43Z. Raw binary and Motorola S-record files that are copied to the drive are programmed directly into the flash of the KL43 and executed automatically. The virtual serial port can be opened with standard serial terminal applications.

## Using the MSD Flash Programmer

- 1 Locate the Precompiled Examples folder in the FRDM-KL43Z Quick Start Package.
- 2 Copy & paste or drag & drop one of the .srec files to the FRDM-KL43Z drive.

The new application should now be running on the FRDM-KL43Z drive.

Program FRDMKL43\_Demo\_freedom.srec example to replace the out-of-box demo on your FRDM-KL43Z drive.

## Using the Virtual Serial Port

- 1 Determine the symbolic name assigned to the FRDM-KL43Z virtual serial port. In Windows [open Device Manager](#) and look for the COM port named "PEMicro/Freescale – CDC Serial Port".

- 2 Open the serial terminal emulation program of your choice. Examples for Windows include [Tera Term](#), [PuTTY](#), and HyperTerminal.
- 3 Program one of the "serial test" applications from the Precompiled Examples folder using the MSD Flash Programmer.
- 4 Configure the terminal program. Most embedded examples use Baudrate115200, 8 data bits, no parity bits, and one stop bit (8-N-1).
- 5 Press and release the Reset button (SW2) at anytime to restart the example application. Resetting the embedded application will not affect the connection of the virtual serial port to the terminal program.

**NOTE:** Refer to the *OpenSDA User's Guide* for a description of a known Windows issue when disconnecting a virtual serial port while the COM port is in use.



# Introduction to OpenSDA

OpenSDA is an open-standard serial and debug adapter. It bridges serial and debug communications between a USB host and an embedded target processor. OpenSDA software includes a flash-resident USB mass-storage device (MSD) bootloader and a collection of OpenSDA Applications. FRDM-KL43Z comes with the MSD Flash Programmer OpenSDA Application preinstalled. Follow these instructions to run the OpenSDA Bootloader and change the installed OpenSDA Application to P&E Debug Application that provides debugging and a virtual serial port all in one application.

### Enter OpenSDA Bootloader Mode

- 1 Unplug the USB cable if attached.
- 2 Press and hold the Reset button (SW2).
- 3 Plug in a USB cable (not included) between a USB host and the OpenSDA USB connector (labeled "SDA") while holding the Reset (SW2) button.
- 4 Release the Reset button

A removable drive should now be visible in the host file system with a volume label of BOOTLOADER. You are now in OpenSDA Bootloader mode.

### Load an OpenSDA Application

- 1 Locate the OpenSDA Applications folder in the FRDM-KL43Z Quick Start Package.
- 2 Copy & paste or drag & drop the Debug Application (DEBUG-APP\_Pemicro\_v108.SDA) to the *BOOTLOADER* drive.
- 3 Unplug the USB cable and plug it in again. The new OpenSDA Application should now be running and now you can debug your application. For more details on Debug mode or Mass storage application refer to the OpenSDA user's guide "OPENS DAUG.pdf"

Use this same procedure to load other OpenSDA Applications

## Explore Further



Now that you are familiar with the FRDM-KL43Z and OpenSDA, it's time to explore the additional software and lab guides available on [www.freescale.com/FRDM-KL43Z](http://www.freescale.com/FRDM-KL43Z). Select your next path from the links in the **Jump Start Your Design section**.

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