Kexx_drv_lib KE06 Sample Code Guide for CodeWarrior

Board configuration, software, and development tools
Rev. 1.0

Contents

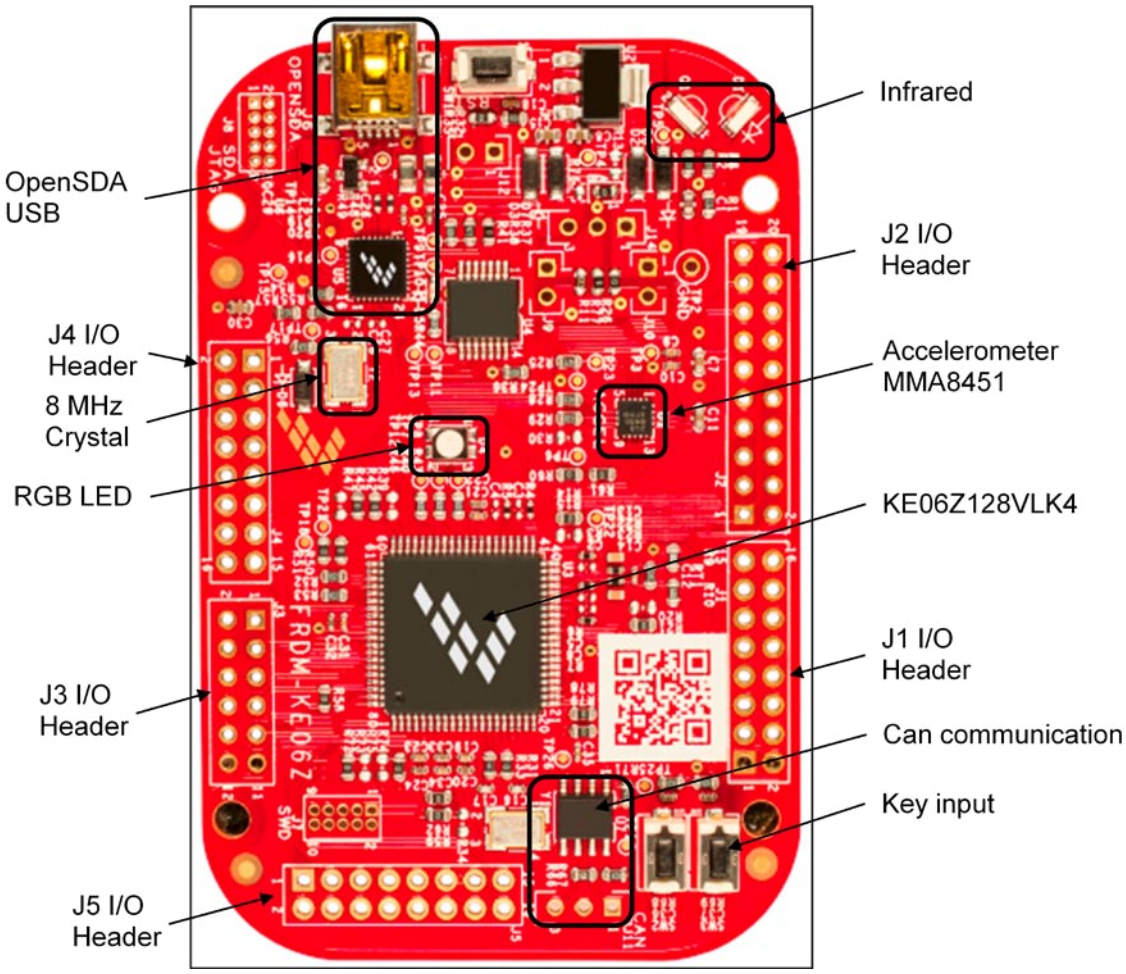
1 Purpose

This Sample Code Guide will familiarize you with FRDM-KE06Z board and development tools. You will learn the features of the FRDM-KE06Z board, the features of the OpenSDA standard, and how to access the source code examples using Code Warrior. In addition, instructions are provided to download a precompiled binary file to your board.

2 Getting to know the board

The Freedom board (FRDM-KE06Z) features the Kinetis KE06Z128VQH2 microcontroller and comes with the following features (which are highlighted in the figure below):

- Tri-color LED
- 10 Mhz crystal
- MMA8451Q Inertial Sensor
- OpenSDA connection
- Mini-B USB connector
- IrDA (infrared)
- Thermistor
- CAN communication



3 OpenSDA Overview

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 features a mass storage device bootloader, which offers a quick and easy mechanism to load applications such as flash programmers, run-control debug interfaces, serial-to-USB converters, and more, onto your Freedom board. Currently, P&E Micro offers two different applications: an MSD application and a debug application.

3.1 MSD Application

This OpenSDA application was developed by P&E Micro and allows the Freedom board to instantiate as a mass storage device on your computer. Once this application properly enumerates, you may program the KE06Z128 on your Freedom board with a binary or SREC file by dragging and dropping one

of these files into the FRDM-KE06Z drive. In addition, you will also have serial communication with the KE06Z128.

3.2 Debug Application

This OpenSDA application (also developed by P&E Micro) allows you to program and debug the KE06Z128 on your Freedom board just as any other debugger module would allow. With this application loaded onto your board, you will also have serial communication with the KE06Z128 available.

4 Download and Install Software and Tools

4.1 Downloading and Installing OpenSDA Drivers

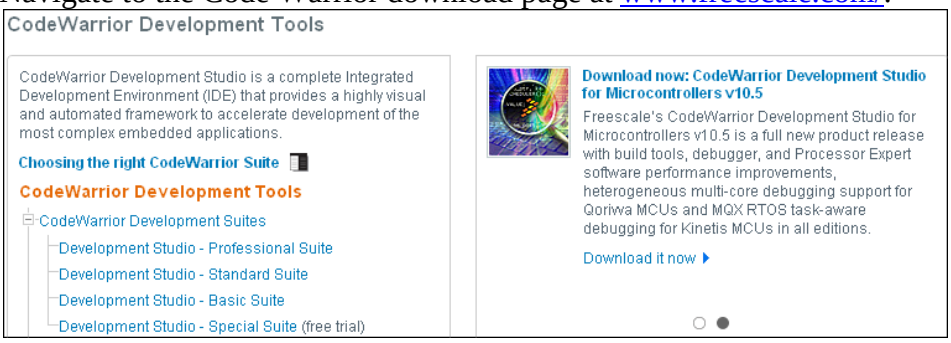
Before you begin, you will need the latest OpenSDA serial drivers installed on your development computer and on FRDM-KE06Z. The latest OpenSDA drivers should already be installed on your FRDM-KE06Z, and your system should be able to automatically find the latest Windows CDC drivers (as they should be pre-installed on the Freedom board). If they are not, see the OpenSDA user's guide found in your Quick Start Package.

4.2 Downloading and Installing Code Warrior v10.5 and Tools

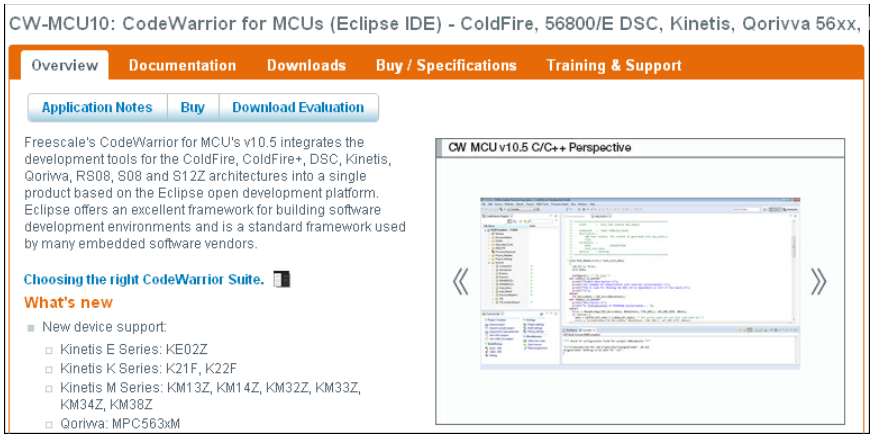
4.2.1 Downloading and Installing the Code Warrior v10.5

To download Code Warrior 10.5, follow these instructions:

1. Navigate to the Code Warrior download page at www.freescale.com/.



2. Click the link in the red line coming into the download page



3. Select the version you want.

4.2.2 Installing the SP for Code Warrior

Install the service pack for KE06 “com.freescale.mcu10_5.Kinetis_KE04_KE06_KEA128_48Mhz.win.sp.v1.0.2.zip”.

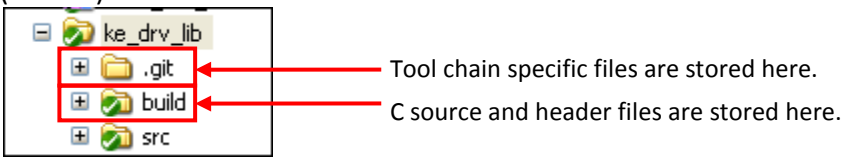
5 Freescale Sample Code

The Freescale sample code for KE06 is bare metal code.

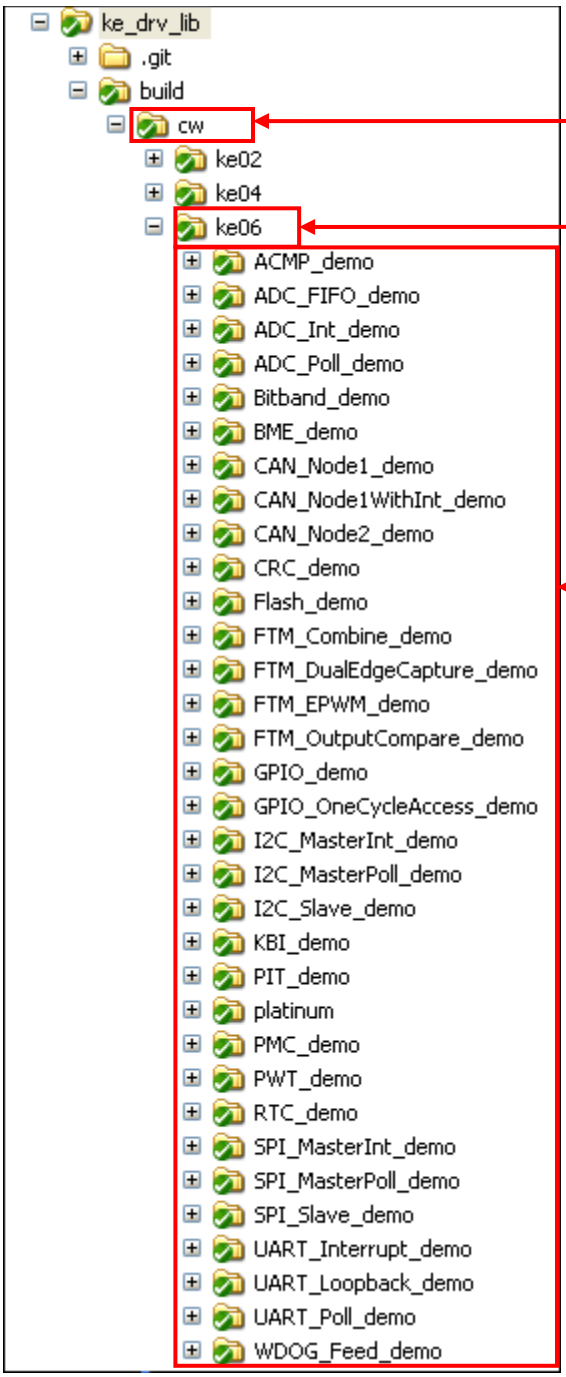
5.1 Baremetal Sample Code (KE06-sc)

5.1.1 Baremetal Sample Code Folder Structure

The Baremetal sample code folder contains two folders at the top level: a build folder and an src (source) folder.



First, the build folder will be discussed.

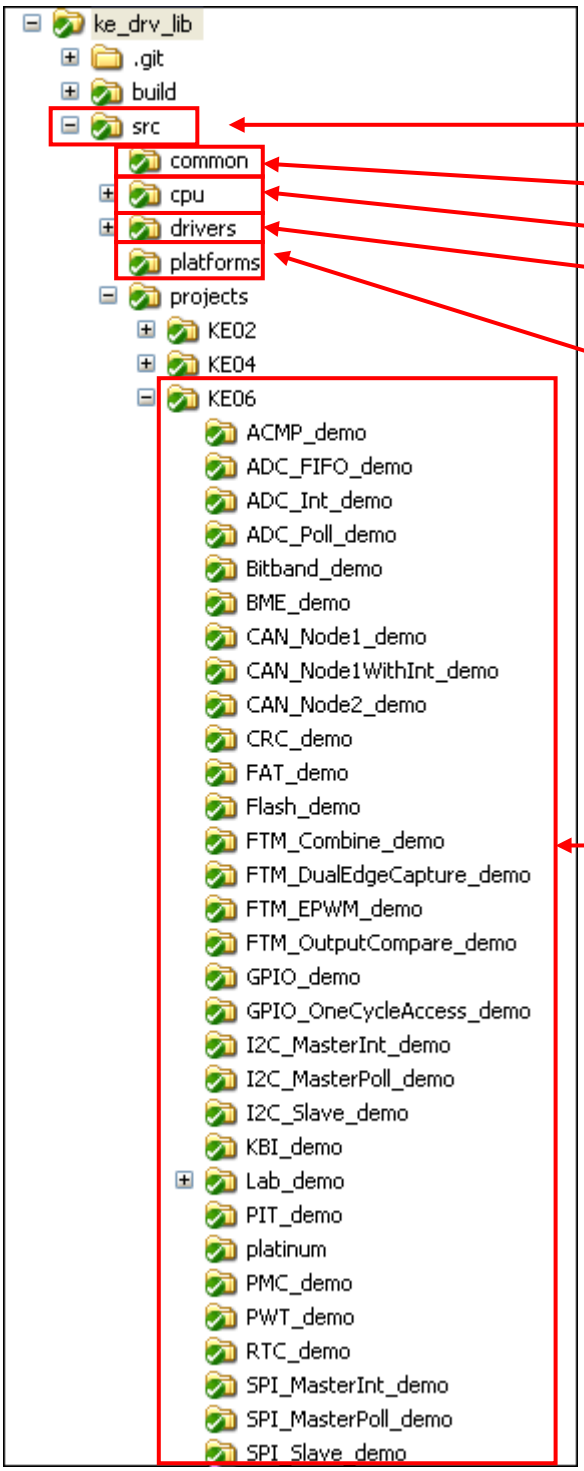


CodeWarrior projects folder.

KE06 CW projects folder.

CodeWarrior project files are stored in these folders. Only toolchain-specific files are stored here, NOT the C source files.

The source folder structure is as follows:



All source files are located here

Source files common to the project and drivers reside here (e.g. printf.c, io.c, stdlib.c, alloc.c, etc.).

CPU header files are stored here.

Peripheral driver source files are located here (e.g.. gpio.c, gpio.h, etc.)

Platform-specific header files are stored here. These files determine start up information for the project (e.g. core frequency, terminal baud rate configuration, which UART to use, etc.).

Project source and header files are stored here. Main will be defined in one of these files for your project.

5.1.2 Using the Freescale Baremetal Sample Code to Jump Start your Design

The Kinetis E Family sample code is provided to jump start your design, and is accompanied by code examples.

6 Configure Hardware

1) Using a Mini-B to A USB cable, connect the FRDM-KE06Z board to your development computer. Be sure to plug the Mini-B connection into the OpenSDA port of the FRDM-KE06Z board.
2) No special hardware configuration is necessary to run the demo applications in the code examples unless otherwise specified by the "readme.txt" file located in the project folder.

7 Terminal Program Configuration

The OpenSDA serial port is designed to enumerate just as any other USB to serial converter. Therefore, you will need to open a serial terminal utility (Tera Term, Hyperterm, etc.) and configure your terminal as follows:

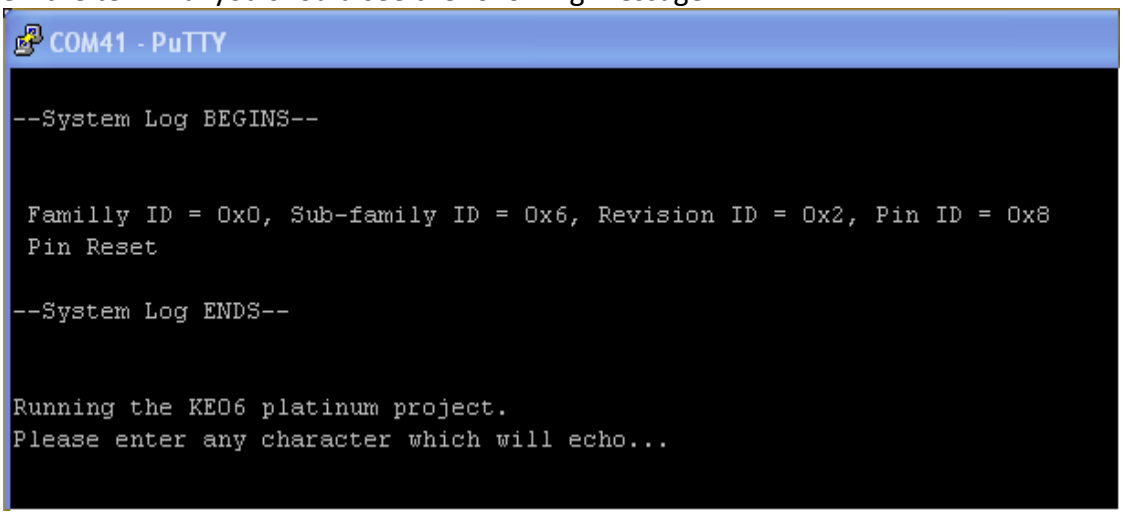
- 9600 baud
- 8 data bits
- no parity
- no flow control

8 Loading and Running the Demos in CodeWarrior

The following instructions describe how to build and flash the Platinum demo using CodeWarrior. This document is targeted for users who choose to use the OpenSDA programming and debugging capabilities and it is assumed that you have loaded the P&E Micro Debug application onto your FRDM-KE06Z. If you need assistance in loading this application onto your FRDM-KE06Z, see the OpenSDA user's guide provided in your Quick Start Package.

1) Open CodeWarrior IDE.
2) Drag the .project file into CW and it will open.
1) Clean the project first and then recompile it.
2) After compilation completes, download the code to the board and start the debugger by pressing the "Debug Session" button.
3) The code will download, and the debugger screen will come up and pause at the first instruction. Hit the "Run" button to start running.

4) On the terminal you should see the following message:



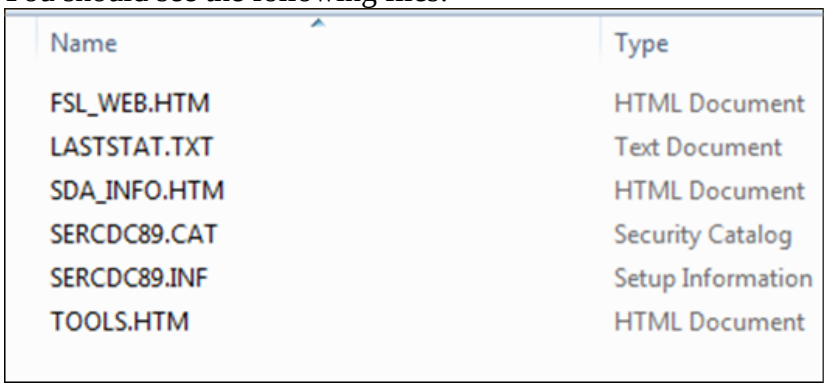
5) The tri-color LED will start blinking.

9 Flashing the Pre-compiled Binary onto your Board

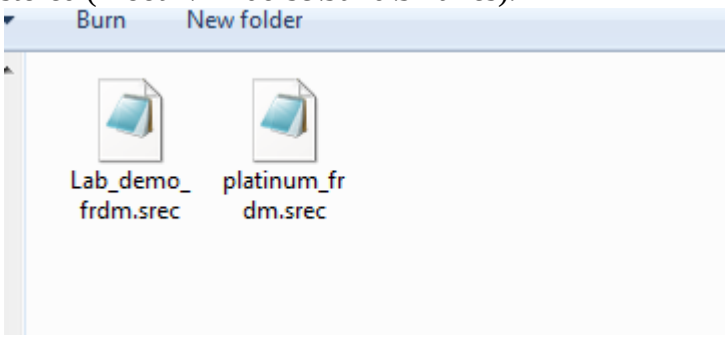
Your FRDM-KE06Z board should come with the OpenSDA MSD application preprogrammed onto the K20 device. If this is the case, you should see the Freedom board enumerate as a USB mass storage device and the FRDM-KE06Z icon should be present in your "My Computer" window.

If the FRDM-KE06Z icon is not available, see the OpenSDA User's Guide to program the MSD application onto your Freedom board. Otherwise, follow these steps to load a pre-compiled binary onto your KE06Z128:

1. Navigate to the FRDM-KE06Z folder in your file system (C:\ FRDM-KE06Z, or you may double click the FRDM-KE06Z icon in the screen displayed above).
2. You should see the following files:



If you do not, reprogram your board with the MSD application. Otherwise, open a second explorer window and navigate to the location where your pre-compiled binary application is stored (<root>\ KE06-sc\build\binaries).



3. Simply drag and drop the Lab_demo_frdm.srec file into the FRDM-KE06Z drive and the KE06Z128 will be automatically programmed with the pre-compiled binary.

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