Quick Start Guide for mbed enabling Freescale FRDM-KL25z Freedom board

FRDM-KL25Z Freedom board is a low-cost evaluation and development platform to demonstrate the capability of the Kinetis-L family of MCUs, ARM® Cortex™-M0+ based and targeting energy-efficient applications. Click here to learn more on FRDM-KL25Z Freedom board.

The mbed platform provides experienced embedded developers with powerful and productive tools for building proof-of-concepts. For developers new to 32-bit microcontrollers, mbed provides an accessible prototyping solution to get projects built with the backing of libraries, resources and support shared in the mbed community.

The mbed team worked with Freescale to ensure that it is possible to mbed-enable the freedom board! Once the Freedom-KL25Z board has been upgraded, it will enable

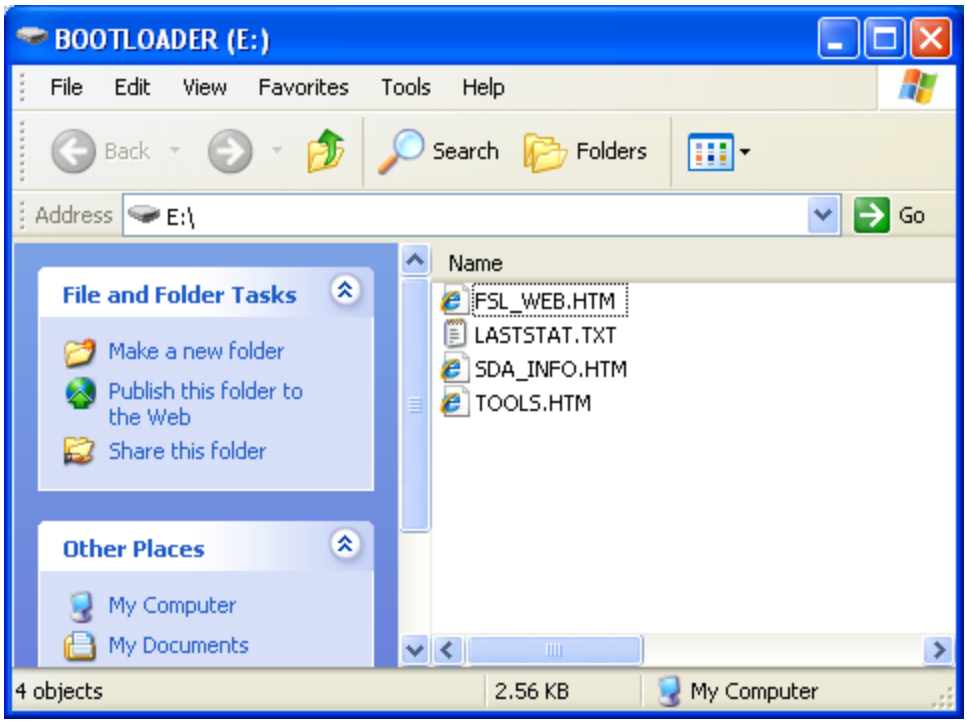
- USB drag and drop programming
- USB Virtual COM port for serial terminal
- CMSIS-DAP interface for programming and debugging from offline tools
- Free access to the mbed online compiler, mbed C/C++ SDK, and developer community

This quick start guide is designed to provide step-by-step guidelines to get you ready to develop your project using mbed on FRDM-KL25Z Freedom board within minutes.

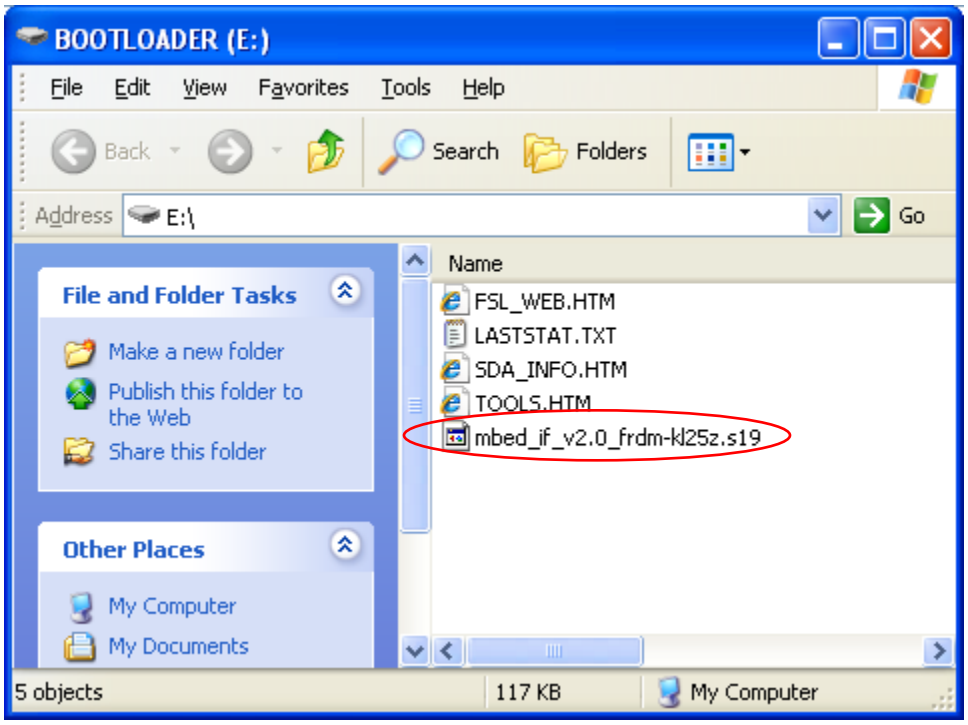
1. Updating the interface firmware to be mbed enabled

Enter FRDM-KL25Z in Bootloader mode using the following procedure:

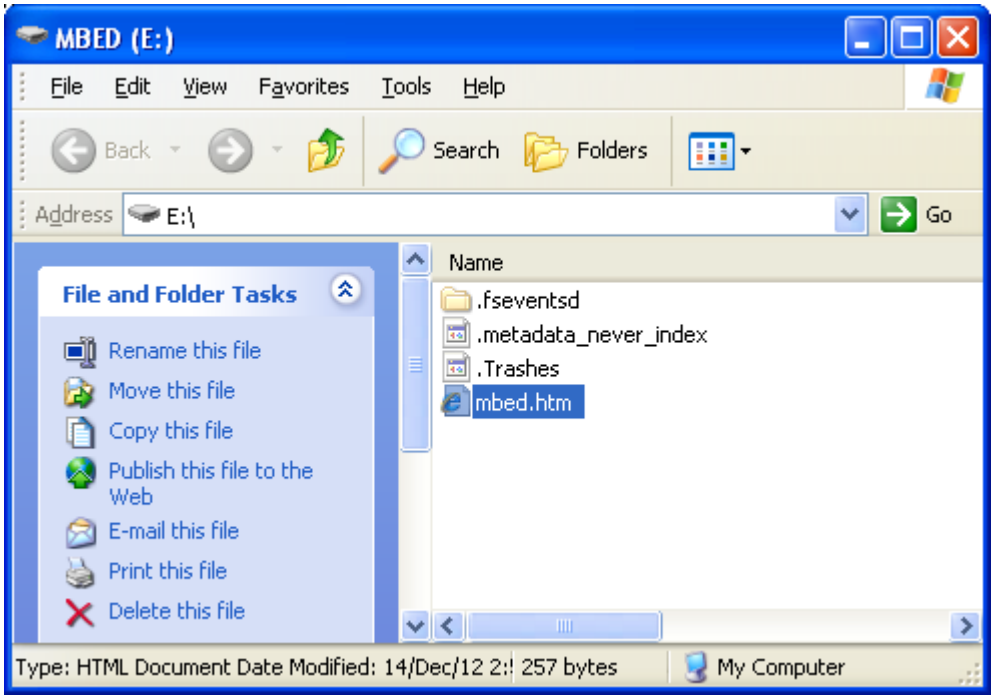
- Unplug the USB cable if attached.
- Press and hold the RESET/Bootloader button.
- Plug in a USB cable from a USB Host to the OpenSDA USB port.
- Release the RESET/Bootloader button.
- A new removable drive should now be visible with a volume label of “BOOTLOADER”.



- Go to the page http://mbed.org/handbook/mbed-FRDM-KL25Z, and download and save the file “mbed_if_v2.0_frdm-kl25z.s19” in your local drive.
- Simply drag/drop or copy/paste the file “mbed_if_v2.0_frdm-kl25z.s19” to the “BOOTLOADER” drive.



- Unplug the USB cable and plug it in again.
- A new removable drive should now be visible with a volume label of “mbed”.

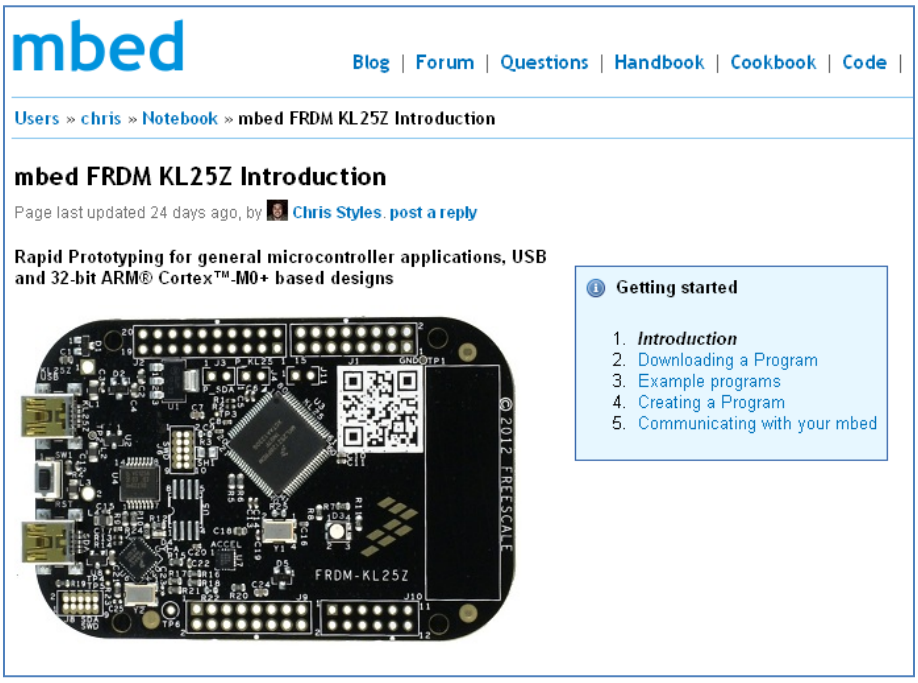


2. Download a program to FRDM-KL25Z

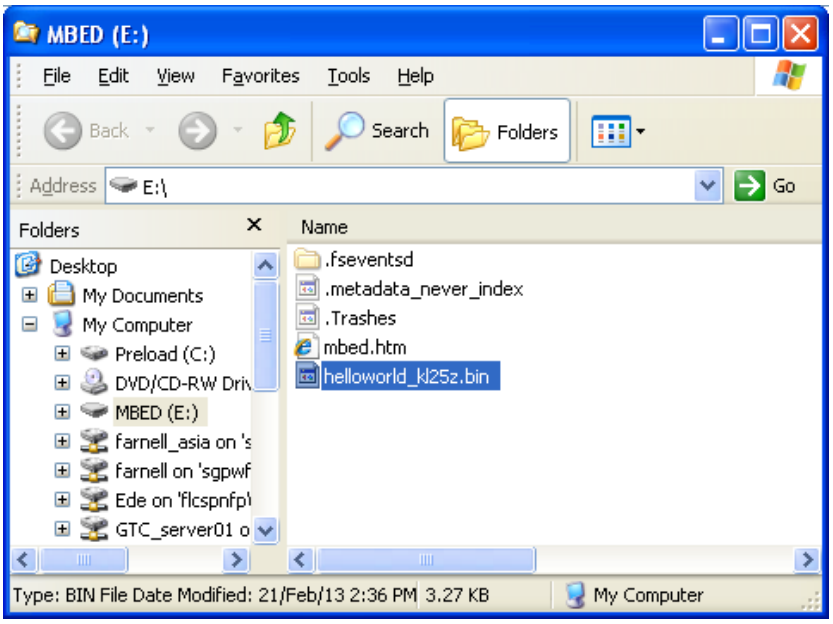
Now let us see how to download a pre-complied program from mbed site, so that you get used to downloading and running programs before you start compiling your own.

- Go to the new “mbed” Drive, and click “mbed.htm” to open it in a web browser.

- Choose "Signup", and create your mbed Account. This will give you access to the Website, Tools, Libraries and Documentation.



- Download the "Hello World!" binary from mbed website (http://mbed.org/users/chris/notebook/mbed-frdm-kl25z-downloading)
- Drag/drop or copy/paste the "Hello World!" binary file to “mbed” drive. The Status LED will flash as the PC writes the file to the Microcontroller disk. **You must wait for the Status LED to stop flashing before pressing reset.**

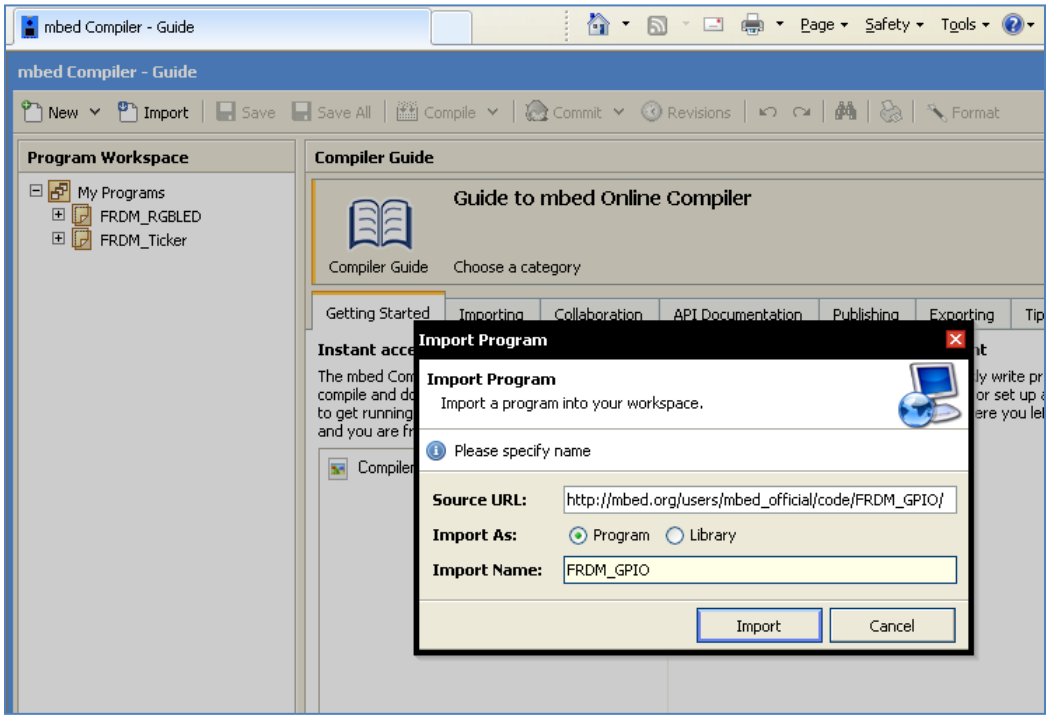


- Press the Reset Button; When the Reset Button in pressed, the newest program on the mbed Microcontroller Disk will be loaded in to the Microcontroller FLASH memory. The Status LED will flash as this happens.
- When the program is has been loaded onto the microcontroller, it will then start it running; flashing the blue LED forever! If you reset the Microcontroller, or disconnect and reconnect the power, the program will simply restart.

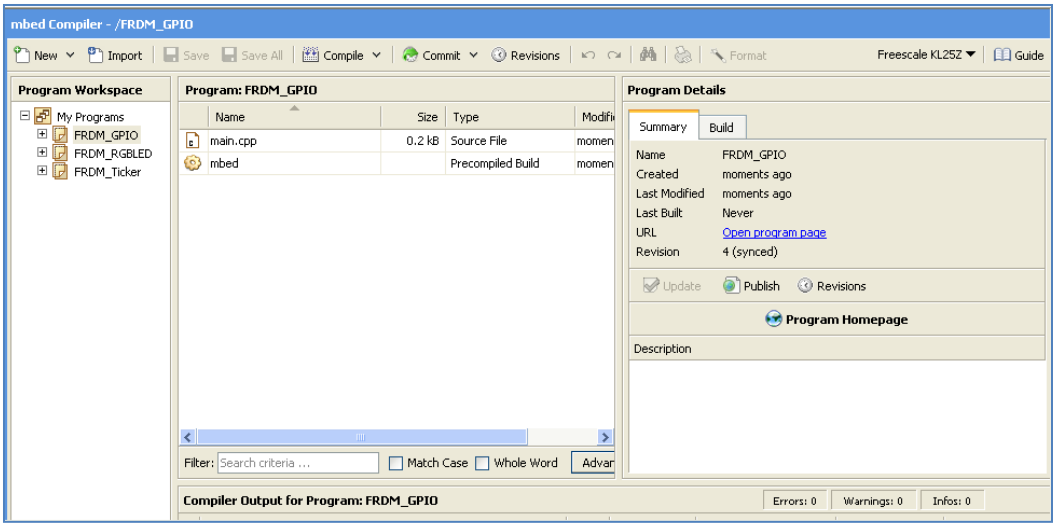
3. Run an online example

There are many sample programs on mbed website (http://mbed.org/users/chris/notebook/mbed-frdm-kl25z-example-programs/) ready to run on the FRDM-KL25Z board. You can go to any examples to run it. Here, we will show you how to run “mbed FRDM-KL25Z - Hello World!” example program to your FRDM-KL25Z board.

- Go to “Example Program page”, and scroll down to find “mbed FRDM-KL25Z - Hello World!” example program.
- Click “Import this program”, it will launch the online complier tool.



- Select Import as “Program” and Click “Import” button, the sample program will be imported to the mbed complier.



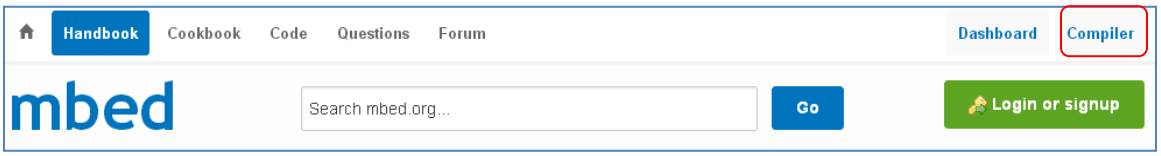
- From the top toolbar, click “Compile”, and save the complied program (.bin) directly to mbed disk. The Status LED will flash as the PC writes the file to the Microcontroller disk. **You must wait for the Status LED to stop flashing before pressing reset.**
- Press the Reset Button, the “Hello World” program will then start it running; flashing the red LED!

4. Getting start to create a program

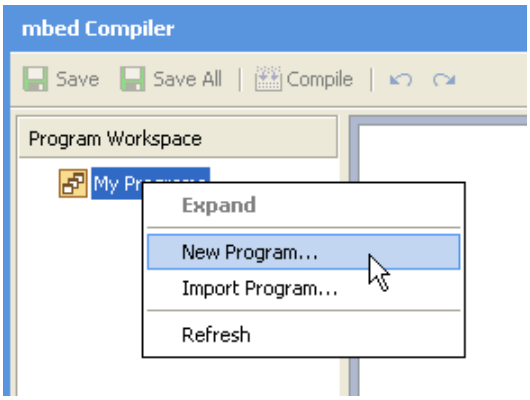
The mbed Compiler is an online application used to create your own programs for the mbed microcontroller. It translates program source code that you write in to a program binary that the Microcontroller can execute.

- **Open the mbed Compiler**

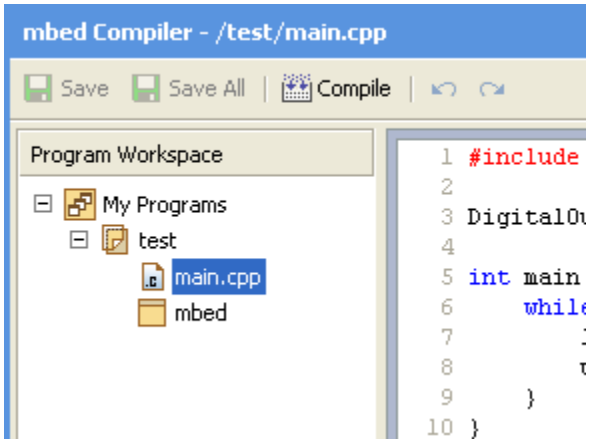
Open the online compiler using the link in the site menu (top-right of the page). This will open the Compiler in a new tab or window.



- **Create a New Program in your personal Program Workspace**
  - Right-click (Mac users, Command-Click) on "My Programs", and select "New Program..."
  - Enter the name of the new program (e.g. "test"), and click "OK"



Your new program folder will be created under "My Programs".



- **View the default program source code**

Click on the "main.cpp" file in your new program to open it in the file editor window. This is the main source code file in your program, and by default contains a simple program already. The code should look like:

```
#include "mbed.h"

DigitalOut myled(LED1);

int main() {
    while(1) {
        myled = 1;
        wait(0.2);
        myled = 0;
        wait(0.2);
    }
}
```

The other item in the program folder is the "mbed" library - this provides all the useful functions to start up and control the mbed Microcontroller, such as the Digital Out interface used in this example.

- **Compile and Download the Program**

To compile the program, click the “Compile” button in the top toolbar. This will compile all the program source code files within the program folder to create a binary program.

After a successful compile, you will get a "Success!" message in the compiler output and the download dialog will pop up. Save it to the location of the mbed Microcontroller drive, and then p reset on the microcontroller to start it running! If there are errors, they will show up in the "Compiler Output" window, and will need to be fixed!

Now you are ready to start your own programs on FRDM-KL25Z freedom board using mbed online platform!