ESF Software Tool Installation Instructions

Windows Indexing

Windows may corrupt the debug MCU bootloader on the FRDM-KL25Z MCU by trying to index it. This will make the debug MCU unusable. To prevent this problem, disable indexing on removable storage devices:

1. Run regedit (e.g. using the Windows search box).
2. Navigate to registry '**HKEY_LOCAL_MACHINE\SOFTWARE\Policies\Microsoft\Windows**',
3. Create a new key with name **Windows Search**, and create a new *DWORD* as **DisableRemovableDriveIndexing** with value of 1.

You can read about the problem and another approach to the solution here:
https://mcuoneclipse.com/2016/08/01/bricking_and_recovering_opensda_boards_in_windows_8_and_10/

Keil MDK ARM

Follow the instructions in **Keil MDK Installation - apnt_232_v3.2.pdf** (pages 3 and 4) to install the MDK ARM Integrated Development Environment and software pack.

Notes:

- After installing MDK ARM, you will need to install Software Packs for the KL25Z128 MCU according to the instructions in section 4 of App Note 232 (http://www.keil.com/appnotes/files/apnt_232.pdf).
- You need to use version 1.13 of Keil Kinetis_KLxx_DFP, as later versions do not include support for the KL25Z. Do not upgrade that pack beyond version 1.13.
- To make the Keil::Kinetis_KLxx_DFP Device-specific pack visible in the Packs tab (Step 4.2.2), you may need to first select (in the Devices tab) "NXP->KLxx Series" or one of the nodes in that subtree.

OpenSDA Debugger Support

Debuggers Available

There are several different OpenSDA debuggers available in the Tools/OpenSDA directory.

- CMSIS-DAP.S19: Use this debugger to run the Keil Application Note 232 examples. It supports debugging with advanced features (MicroTrace Buffer and Conditional Variables).
- MSD-DEBUG-FRDM-KL25Z_Pemicro_v118.SDA: Use this debugger for the optimization lab exercises. It supports debugging and a virtual serial port over the USB connection. It is programmed into the debug MCU for new FRDM-KL25Z boards.
- Segger_12_OpenSDA_FRDM-KL25Z.bin: We will not use this debugger, but it supports debugging and a virtual serial port over the USB connection.

Updating the OpenSDA Adapter

These instructions are generalized from Step 6 of Keil Application Note 232.

a) Locate the desired debugger file in the Tools/OpenSDA directory.
b) Put the FRDM-KL25Z board into bootloader mode.

i) Hold the reset button down and connect a USB cable to J7 SDA.
ii) When you hear the PC make the USB enumeration dual-tone, release the reset switch.
iii) The green LED D4 will blink slowly, indicating the K20 is ready to be programmed with an application. Windows File Explorer will open a window called Bootloader.

c) Drag and drop (or copy and paste) the correct debugger file from Tools/OpenSDA onto Bootloader.
d) Exit bootloader mode
i) Cycle power to the FRDM-KL25Z without pressing the reset switch.

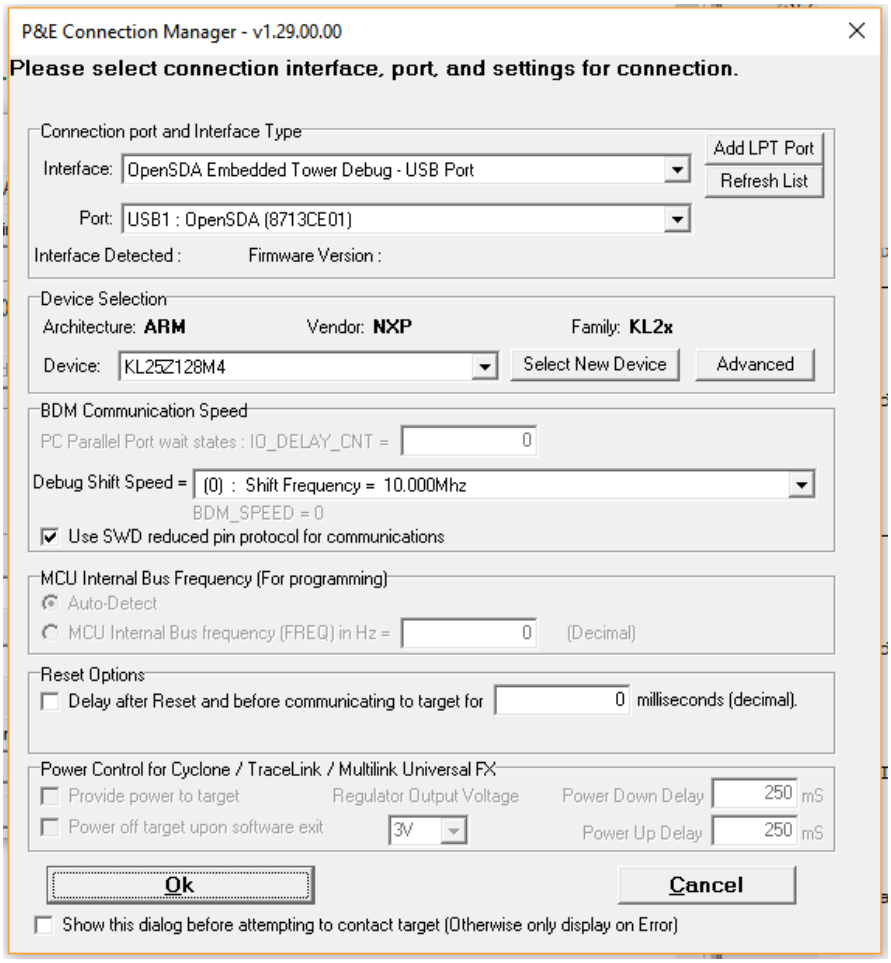
Using the PEMicro Debugger

1. **Run PEDrivers_install.exe (located in OpenSDA) as administrator to add support for the PEMicro debugger adapter.**
2. Then follow this revised version of the Keil application note's Step 7:

a) Start uVision and open a sample project (e.g. the first lab project).
b) Select Target Options -> Debug tab:

c) Ensure the PC is connected to a FRDM-KL25Z board through its SDA USB socket.

d) Check the Use button on the right half of the window. Select Use PEMicro Debugger and click on settings. You should get a window similar to this:



e) **Connection Port and Interface Type**: Set the Interface as shown above. Press the Refresh List button so that Port displays your MCU board.

f) **Device Selection:** If Device is blank, click Select New Device and select the KL25Z128M4 under NXP->KL2x, then click OK.

g) Click OK to save changes to P&E Connection Manager.

h) Click OK to save changes to Debug Options for Target.

i) Build the code by pressing F7 or 

j) Download the code to the target MCU by selecting Flash->Download or pressing 

Elsewhere in that document you may generally treat references to CMSIS-DAP as PEMicro references.

Tera Term

This is a serial terminal emulator program. Download the installer from https://osdn.net/projects/ttssh2/releases/ and run it to install the program.

Appendix: Other Tools

These tools may also be useful.

Sigrok Pulseview

1. Download the installer for pulseview (*not* sigrok-cli) from https://sigrok.org/wiki/Downloads , or use the copy in Tools/Installers. There is additional information for the Windows version available at https://sigrok.org/wiki/Windows#Windows_installers.
2. Run the installer. If Windows complains of an unknown program source, install the program regardless.

OpenBench Logic Sniffer

No installation is required. To run the program, double-click ols-0.9.7.2\run.bat.

Freedom_LogicAnalyzer

Executable image file for FRDM-KL25Z to gather data for OpenBench Logic Sniffer. Source for project is located at https://github.com/ErichStyger/mcuoneclipse/tree/master/Examples/CodeWarrior/FRDM-KL25Z/Freedom_LogicAnalyzer

GLCD Font Creator

Program to create bitmap fonts from Windows fonts.

Logic

Logic analyzer program for Saleae logic analyzers.