Developing Software Project Using Keil MDK-ARM Version 5

All the programs in the book were developed under Keil MDK-ARM v4.71. Since then, Keil has released v5. A major change in Keil v5 is the creation of device family support software packs.

If this is the first time you start a project for Tiva C Series microcontroller and you have not install the Device Family Pack yet, click the Pack Installer button to launch the installer. You only have do this once.
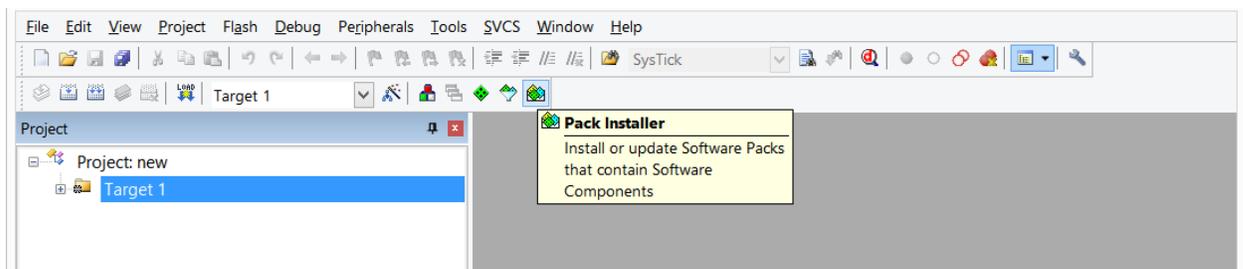
After the Pack Intaller is launched, it takes a short time to fill the list of devices. On the right panel, select **Devices** tab then scroll down and expand Texas Instruments then click select **Tiva C Series**. The **Keil::TM4C_DFP** will be added to the left panel under **Packs** tab. Click the **Install** button to the right of TM4C_DFP in **Action** column and the installation will start. It may take several minutes to install the pack. When the pack is installed the **Action** button turns green.

If it asks you whether you want to add the new device family pack to the project or not. Click Yes.
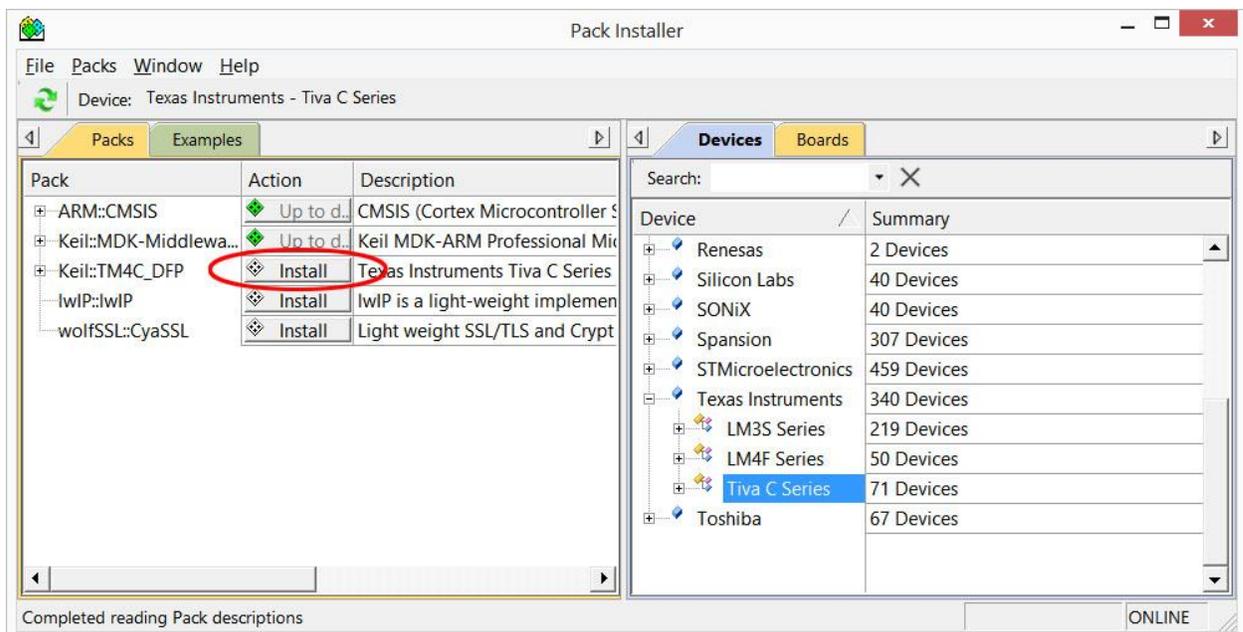
When you start a new project in Keil v5, after selecting the target device a window will pop up for you to manage the run-time environment. For all the sample programs of the book, you need to select **CMSIS->CORE** and **Device->Starup** as seen in the figure below.
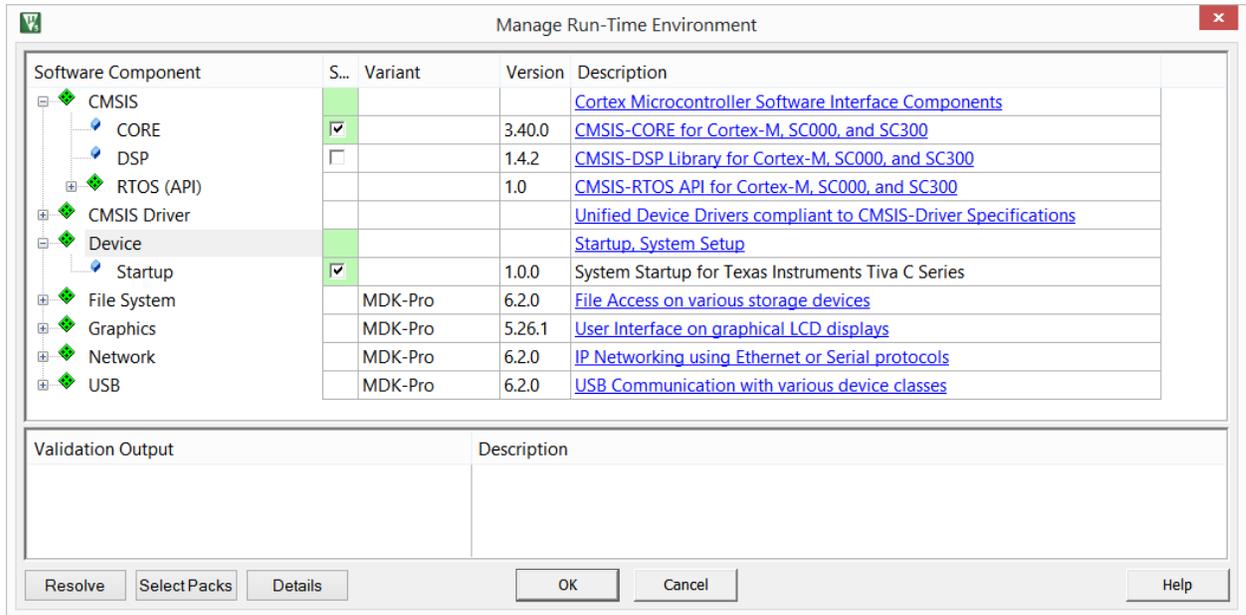
The projects in Keil v5 are created with an additional startup file named system_TM4C123.c.

This startup file system_TM4C123.c contains the function SystemInit() which is in conflict with the function of the same name in the sample programs of the book. The conflict can be easily resolved by deleting the SystemInit() function in all the sample programs.

The other issue with the SystemInit() function in the new system_TM4C123.c is that it configures the clock generation and results in a different system clock rate than the default 16 MHz. All the sample programs in the book assume the default 16 MHz system clock. Some of these sample programs will have timing issues with Keil v5. You may retain the default system clock rate in Keil v5, by the following steps:

1. Expand the Project->Device to show system_TM4C123.c (startup)
2. Double click to open the file in editor window
3. Find the line "`#define CLOCK_SETUP 1`" as the figure below
4. Comment out the line
5. Rebuild the project

Project
- Project: p11_2
  - Target 1
    - Source Group 1
      - p11_2.c
    - CMSIS
    - Device
      - startup_TM4C123.s (Startup)
      - system_TM4C123.c (Startup)

```
29  //          <i> Uncheck this box to skip the clock configuration.
30  //
31  // The following controls whether the system clock is configured in the
32  // SystemInit() function.  If it is defined to be 1 then the system clock
33  // will be configured according to the macros in the rest of this file.
34  // If it is defined to be 0, then the system clock configuration is bypassed.
35  //
36  #define CLOCK_SETUP 1
37
38  //******************************** RCC ****************************************
39  //
40  // <h> Run-Mode Clock Configuration (RCC)
```