Stellaris® Development and Evaluation Kits for Code Composer™ Studio

The Stellaris Development and Evaluation Kits provide a low-cost way to start designing with Stellaris microcontrollers using Texas Instruments' Code Composer Studio development tools. The evaluation boards can function as either a complete evaluation target or as a debugger interface to any external Stellaris device.

Requirements

- You have a PC with a USB interface, running Microsoft® Windows XP (SP2 or greater) or Vista
- You have the Workshop Installation Software Flash Drive

CAUTION: There is a known electrical issue with the FT2232 device that is used in the on-board In Circuit Debug Interface (ICDI). Some USB hubs can cause the device to misbehave, with symptoms ranging from failed enumeration to corrupt data transfers. If you experience trouble when using the on-board ICDI, try connecting the USB cable directly to one of the USB ports on your PC or laptop.

Code Composer Studio

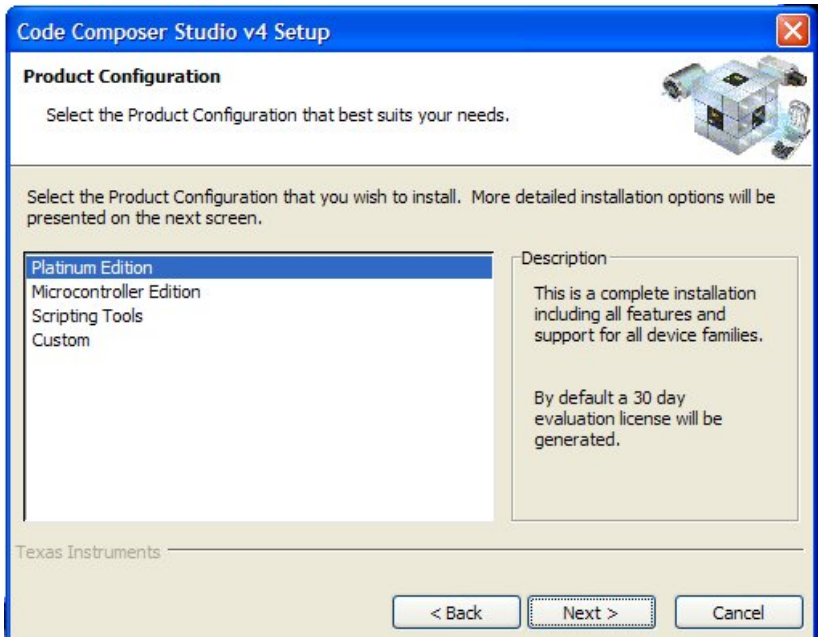
This quickstart shows you how to install the Code Composer Studio development tool and how to use it to build and run an example application on your Stellaris Evaluation or Development Board.

Step 1: Install Code Composer Studio

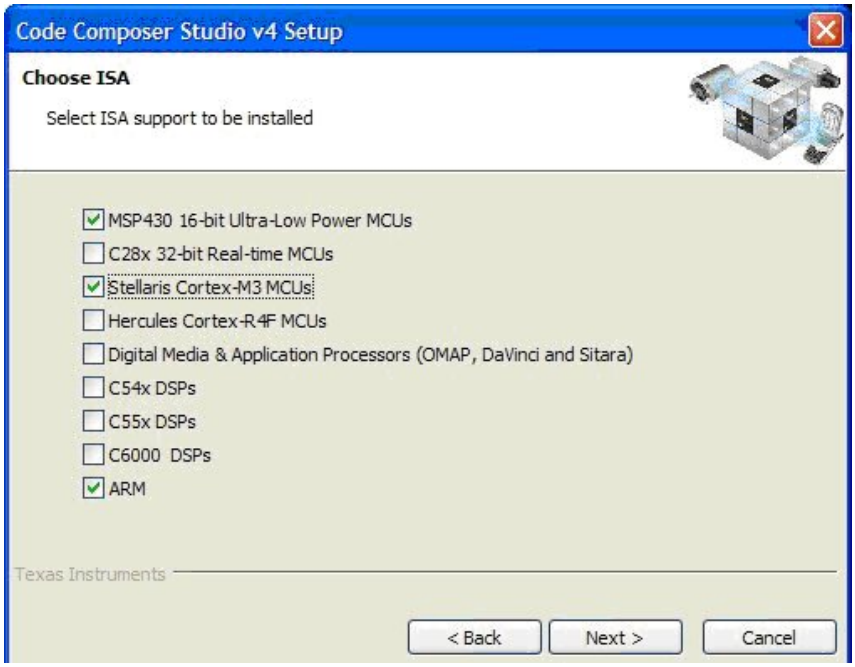
1. **Disconnect** any evaluation board that you have connected to your PCs USB port(s). **Insert** the Workshop Installation Flash Drive into a free USB port.

2. Using **Windows Explorer**, find the **setup_CCS_4.1** folder on the Flash drive and double-click on the file named **setup_CCS_n.n.n.n.exe**.

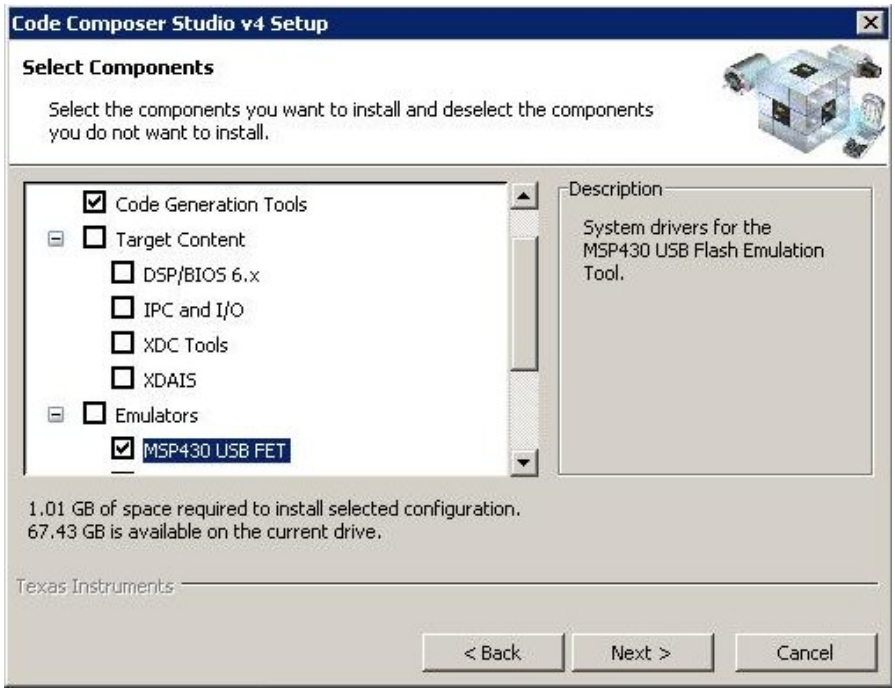
3. Follow the instructions in the Code Composer Studio installation program. Select the **Platinum Edition** for installation when the **Product Configuration** dialog window appears. Click **Next**.



4. In the **Choose ISA** dialog, if you are attending a Stellaris only workshop, make sure that only the **Stellaris Cortex-M3 MCU** and **ARM** checkboxes are selected. If you are also attending an **MSP430** workshop, check that checkbox too. Click **Next**.



5. In the **Select Components** dialog, **uncheck** the **Target Content** and **Emulators** checkboxes. If you are attending a **Stellaris only** workshop, click **Next**. If you are attending a **MSP430** workshop too, check the **MSP430 USB FET** checkbox and click **Next**. The installation should take less than 10 minutes to complete.



If you've been tasked with installing Code Composer only, please stop here and ask your instructor for further directions.

Step 2: Install the StellarisWare® Package

A full set of C-based peripheral drivers is provided, covering all peripherals and functionality of the Stellaris devices. The StellarisWare package includes various example applications with project files for all major tool vendors that support Stellaris, including Code Composer Studio. To install StellarisWare components, follow these steps:

1. Make sure that the **Workshop Installation Flash Drive** is inserted into one of your PC's USB ports.

2. Using **Windows Explorer**, **open** the Flash drive and find the StellarisWare installation file that matches your board.

- **LM3S3748 board SW-EK-LM3S3748-5451.exe**
- **LM3S8962 board SW-EK-LM3S8962-5451.exe**

   Double-click on the file for your board and select the **default** installation location when prompted. If you intend to run the labs for **both** boards, you will need the drivers and StellarisWare for **both** boards installed.

   If you run a second (or more) StellarisWare installation, use the **default** installation directory. The board files will be installed in separate folders for each board. When you are warned about overwriting files, click **Yes to all**. All the overwritten files are the same.

NOTE: Check the www.ti.com/Stellaris web site for the latest software updates.

Step 3: Start Code Composer Studio and Open a Workspace

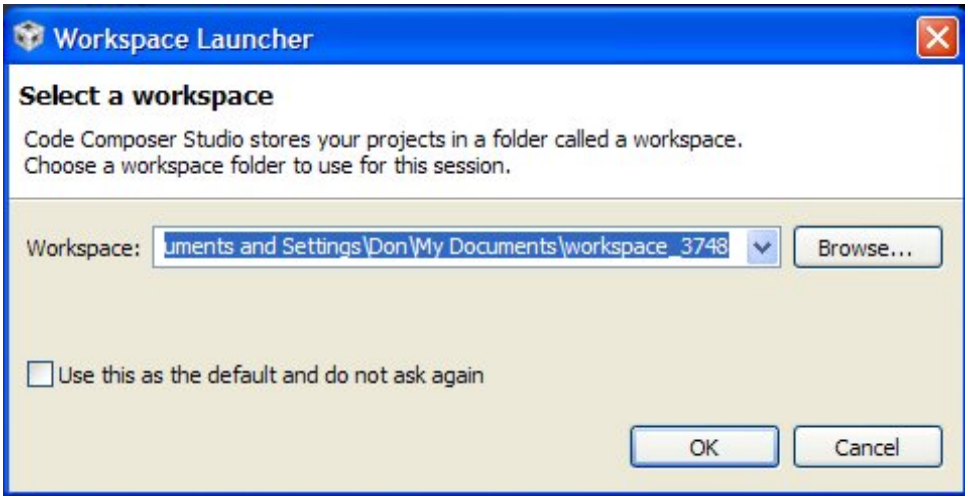
1. **Start** the **Code Composer Studio** IDE by selecting it from the Windows Start menu or double-clicking the icon installed on your desktop.

When the IDE loads, it asks you where to open the workspace folder. To keep your projects separated, you should use a workspace for each board.

If you are using the **LM3S3748** board, name your workspace **workspace_3748**.

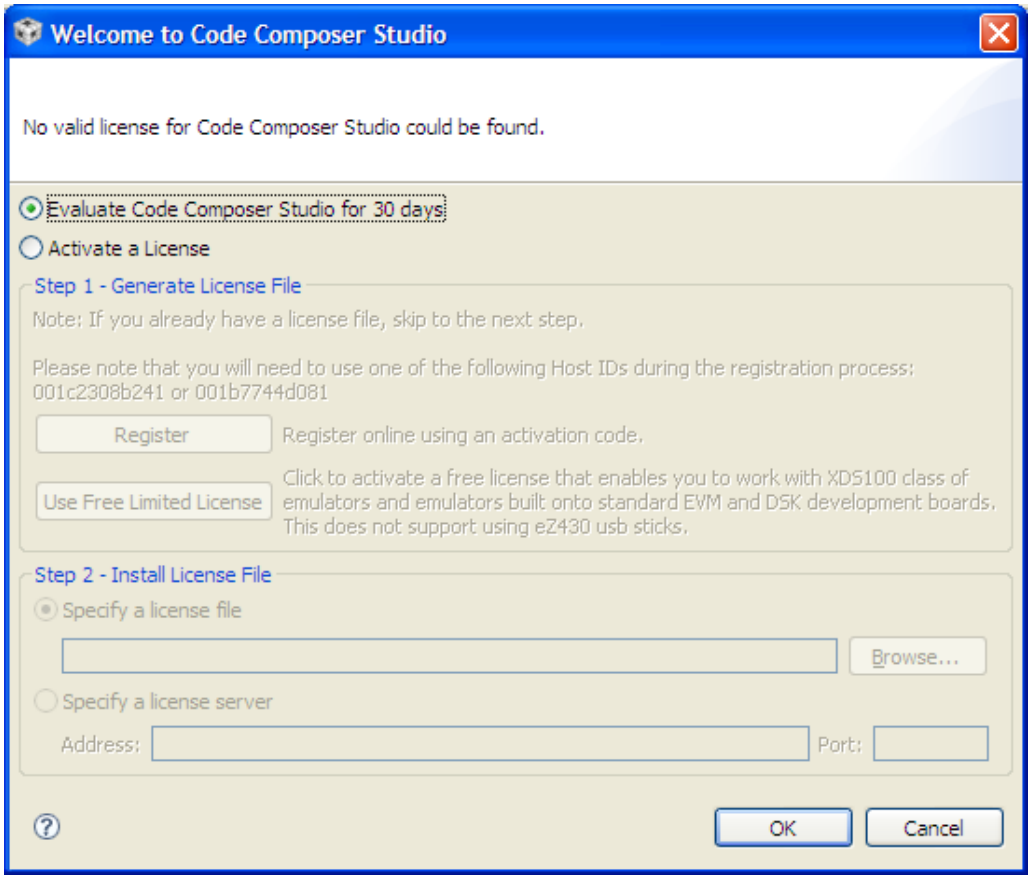
If you are using the **LM3S8962** board, name your workspace **workspace_8962**.

Do **not** check the **Use this as the default and do not ask again** checkbox. While it's possible to switch back and forth in the IDE, it's best to select your workspace at the start to prevent confusion. Click **OK**.



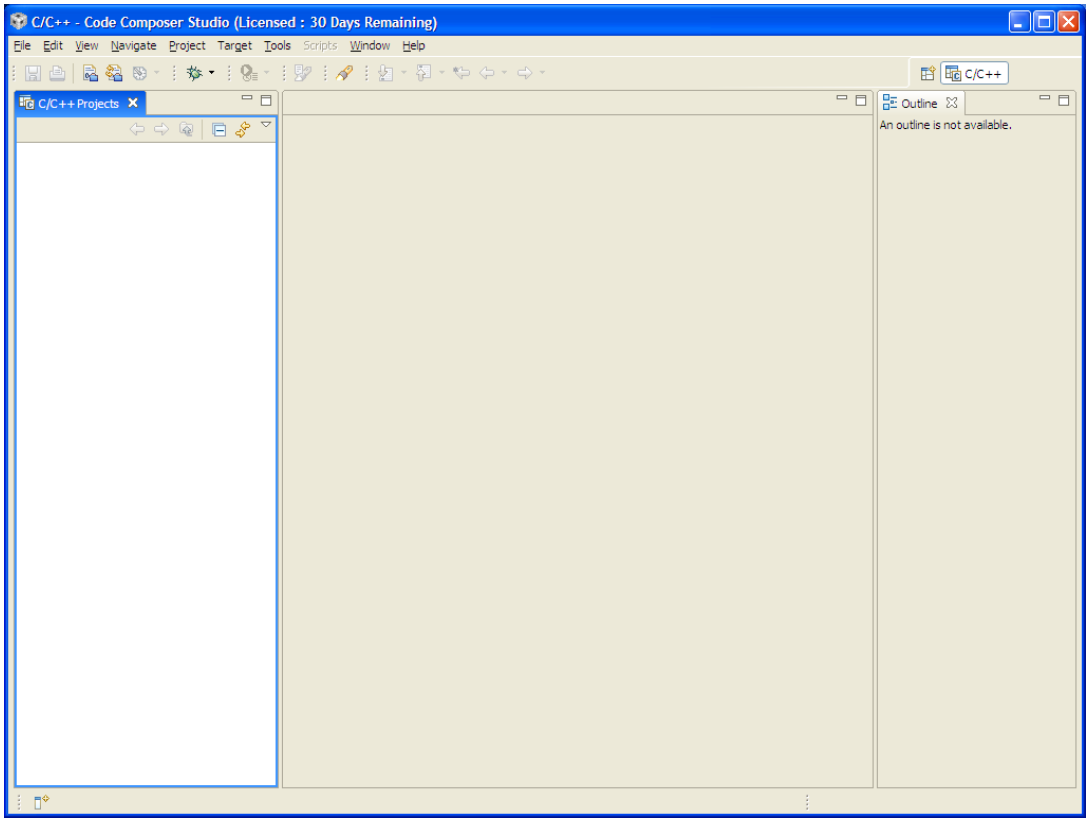
2. If this is the first time you have run **Code Composer Studio IDE**, a dialog box may appear like the one shown below. If the dialog appears, select **Evaluate Code Composer Studio for 30 days** unless you already have a license that you wish to activate. Click **OK** to continue.

   NOTE: If you have previously installed a Code Composer evaluation disk, you may not be able to move beyond this screen. Ask your instructor for assistance.



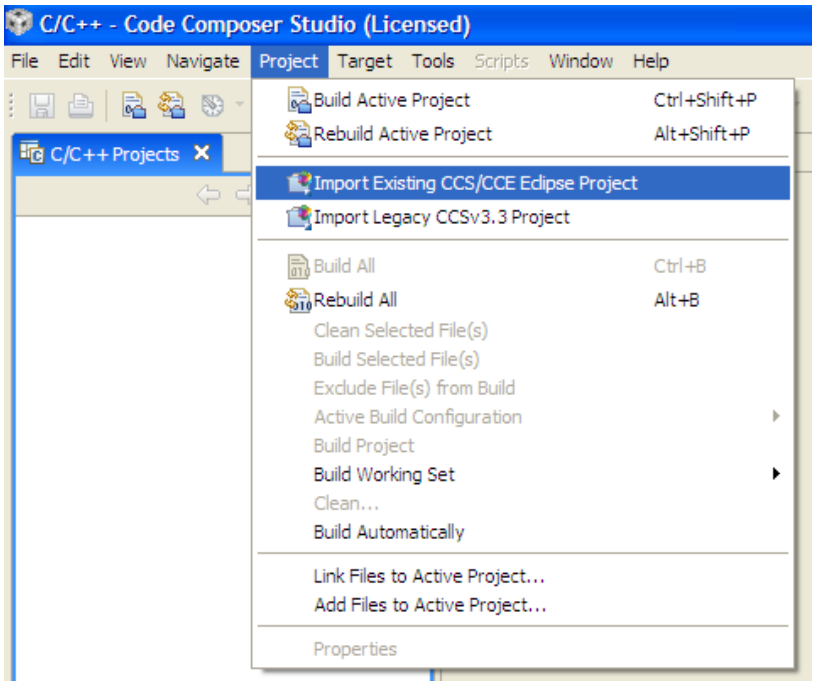
3. **Code Composer Studio** may now open with the welcome page. If so, close out the welcome page by clicking the link in the upper right

or by clicking the **X** on the **tab**. You should now have an empty workspace like that shown below. **Maximize** the window.

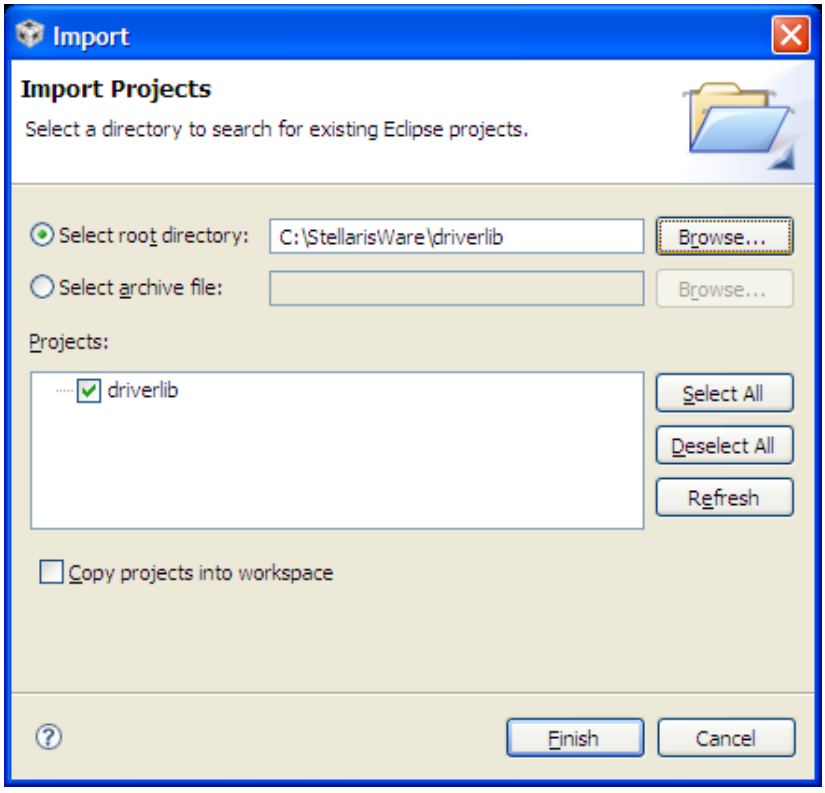


Step 4: Import Libraries

1. From the menu bar, click on **Project**, and then select **Import Existing CCS/CCE Eclipse Project**.

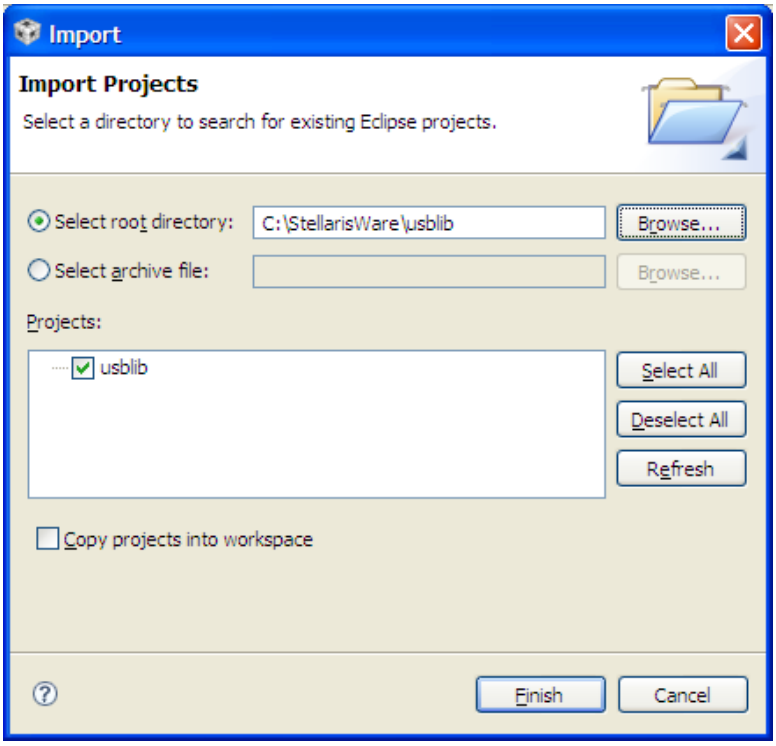


2. The **Import** dialog appears. Browse to the root directory of the driver library (**C:\StellarisWare\driverlib**) and click OK. Be sure that the checkbox next to **driverlib** in the Project pane is **checked** and that **Copy projects into workspace** is **unchecked**. Click **Finish**.



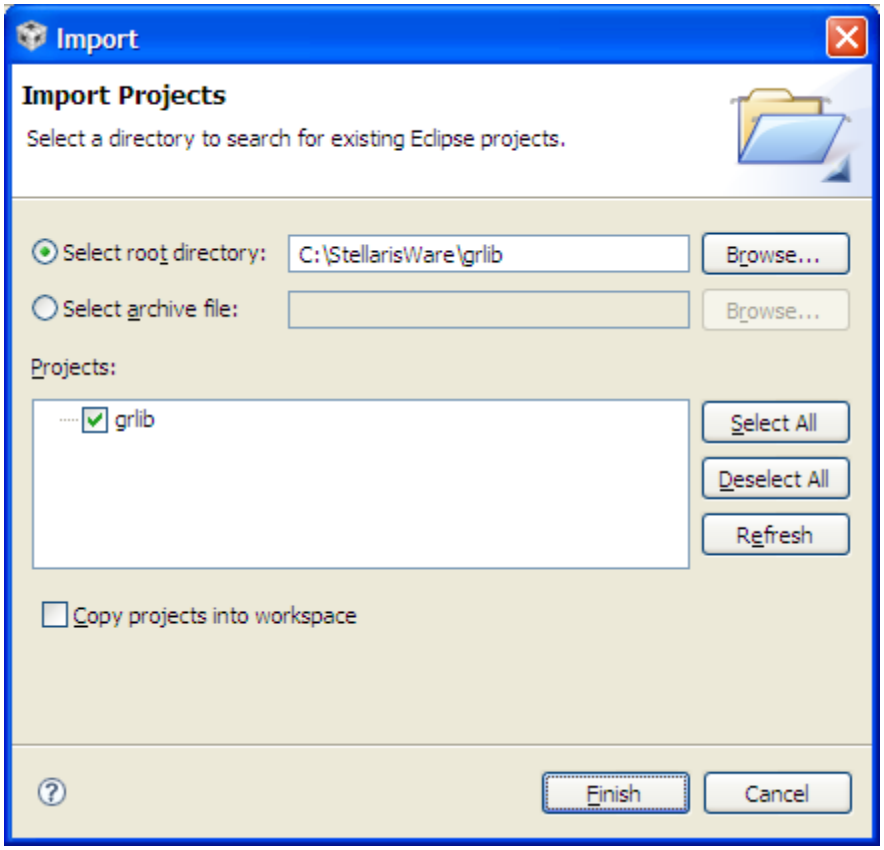
3. **Skip this step if you are using the LM3S8962 board.**

   Select **Import Existing CCS/CCE Eclipse Project** from the **Project** menu again. Browse to the root directory of the USB library **(C:\StellarisWare\usblib)** and click **OK**. Be sure that the checkbox next to **usblib** in the Project pane is **checked** and that **Copy projects into workspace** is **unchecked**. Click **Finish**.



4. **Skip this step if you are using the LM3S8962 board.**

   Select **Import Existing CCS/CCE Eclipse Project** from the **Project** menu again. Browse to the root directory of the graphics library (C:\StellarisWare\grlib) and click **OK**. Be sure that the checkbox next to **grlib** in the Project pane is **checked** and that **Copy projects into workspace** is **unchecked**. Click **Finish**.



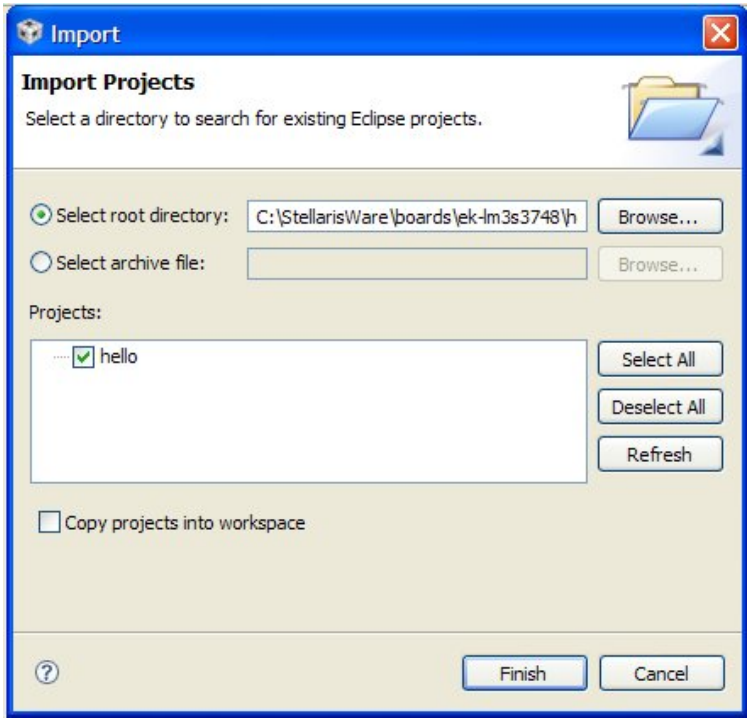
Step 4: Import Board Example

5. Select **Import Existing CCS/CCE Eclipse Project** from the **Project** menu again. Browse to the root directory for your chosen board ...

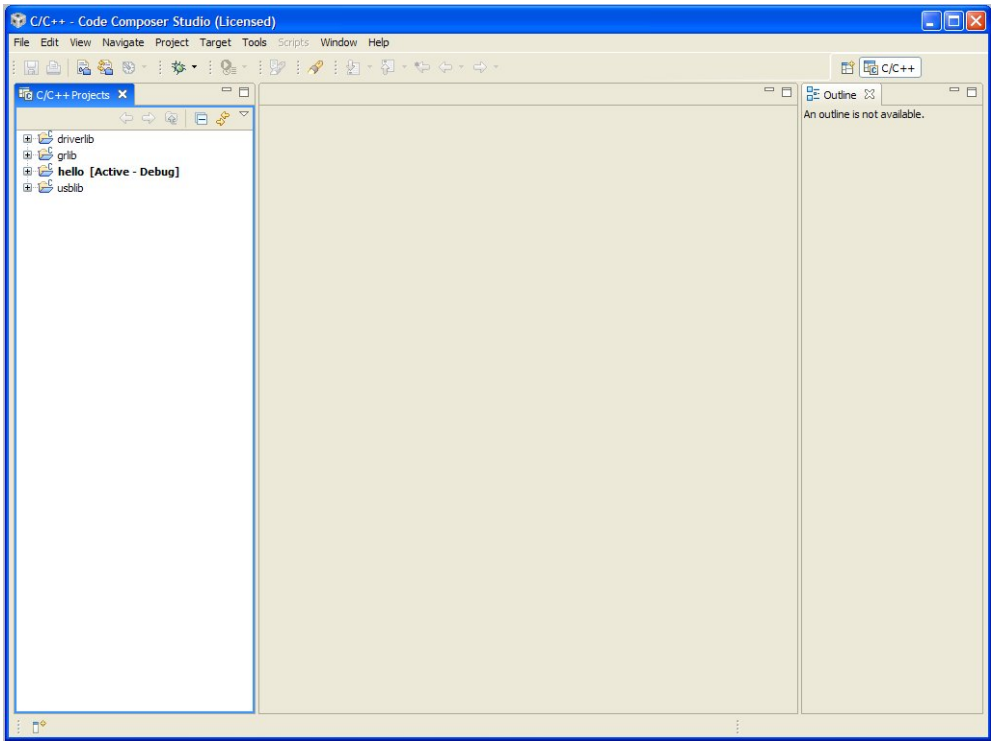
    - **C:\StellarisWare\boards\ek-lm3s3748** for the **3748** board
    - **C:\StellarisWare\boards\ek-lm3s8962** for the **8962** board

Browse to the root directory of the **hello** project and click **OK**.

The example screen shot below has the **EK-LM3S3748** board as the chosen board. **(C:\StellarisWare\boards\ek-lm3s3748)**. Be sure that the checkbox next to **hello** in the Project pane is **checked** and that **Copy projects into workspace** is **unchecked**. Click **Finish**.



6. All of the imported projects now appear in the **Projects Explorer** pane.

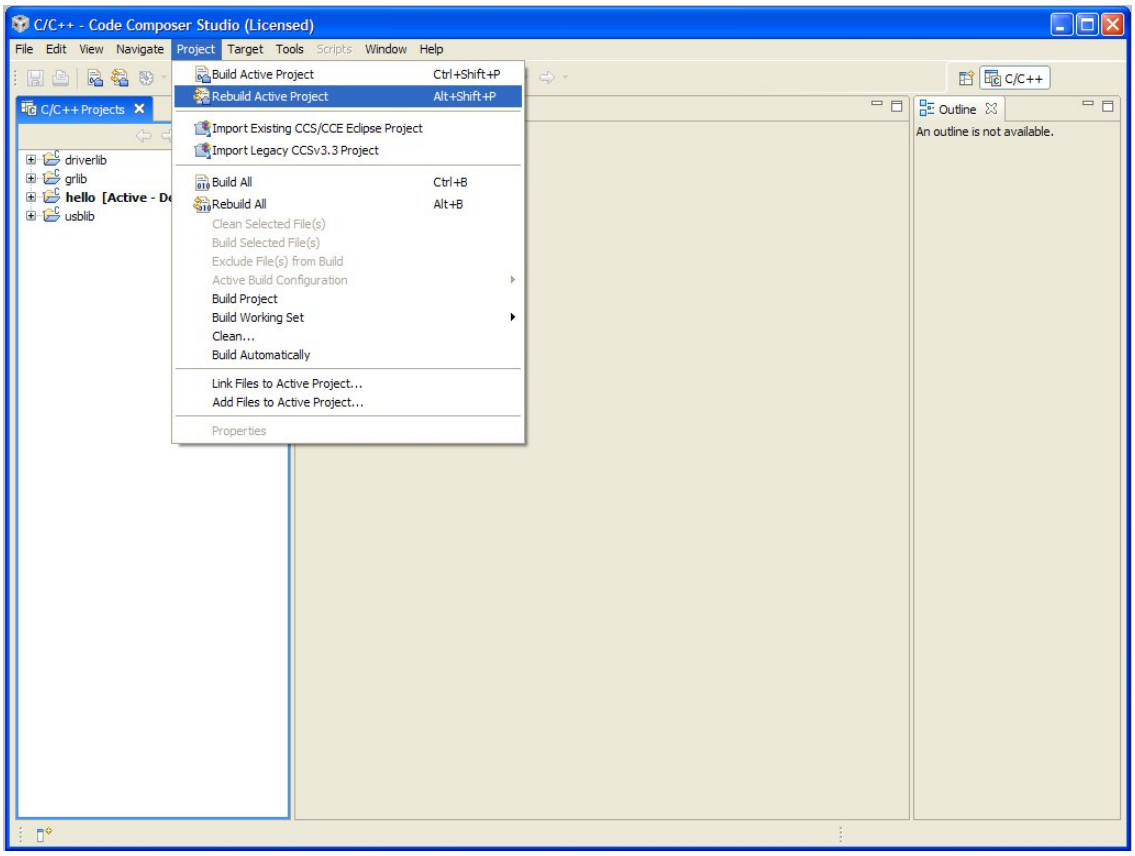


Since the **hello** project was the last one imported, it becomes the **Active Project**. Otherwise, you can right-click on it a set it as the **Active Project**.

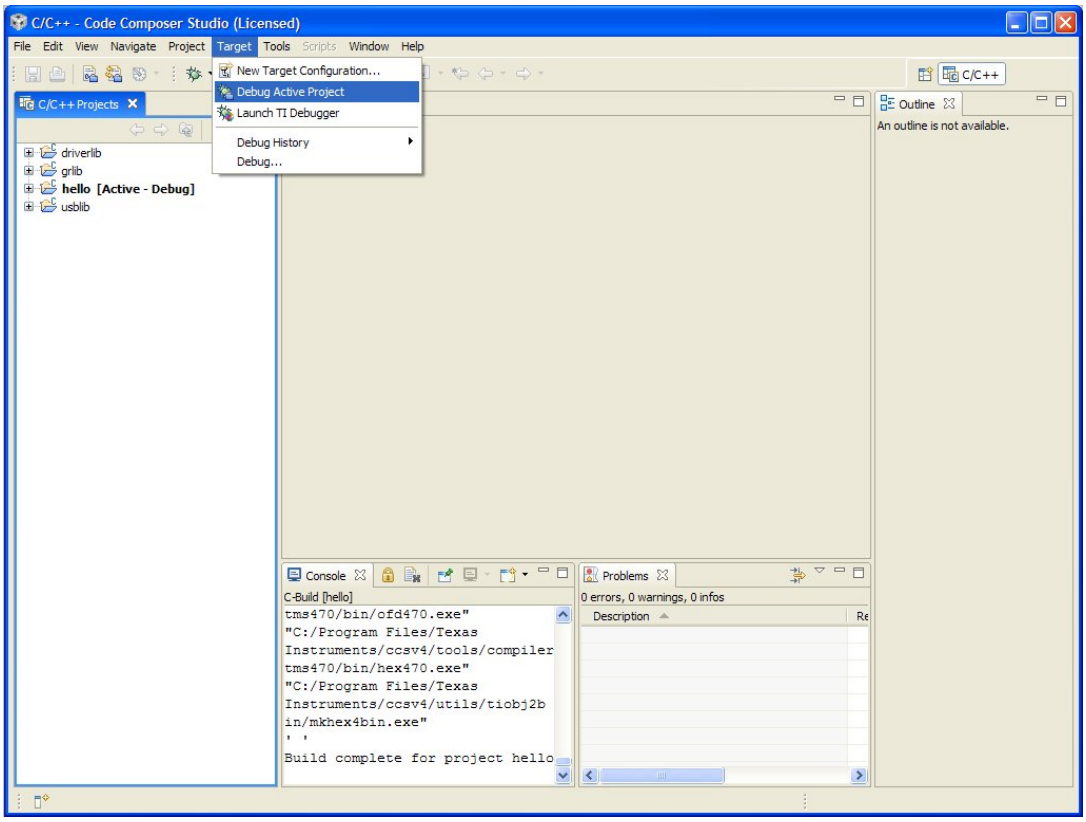
Step 5: Building and Debugging a Project

1. Make sure that the **power switch** on your development board is in the **SELF** position, if your board has a switch. Then connect your development boards **DEBUG USB** port to your laptops USB port. Don't change the position of this switch while the board is powered as you may damage the switch's internal contacts.

2. On the menu bar, click on **Project** and select **Rebuild Active Project**. The build may take a few moments. As the project builds, messages scroll by in the console window. When the build is complete, the words **Build complete for project hello** will appear in the console window.



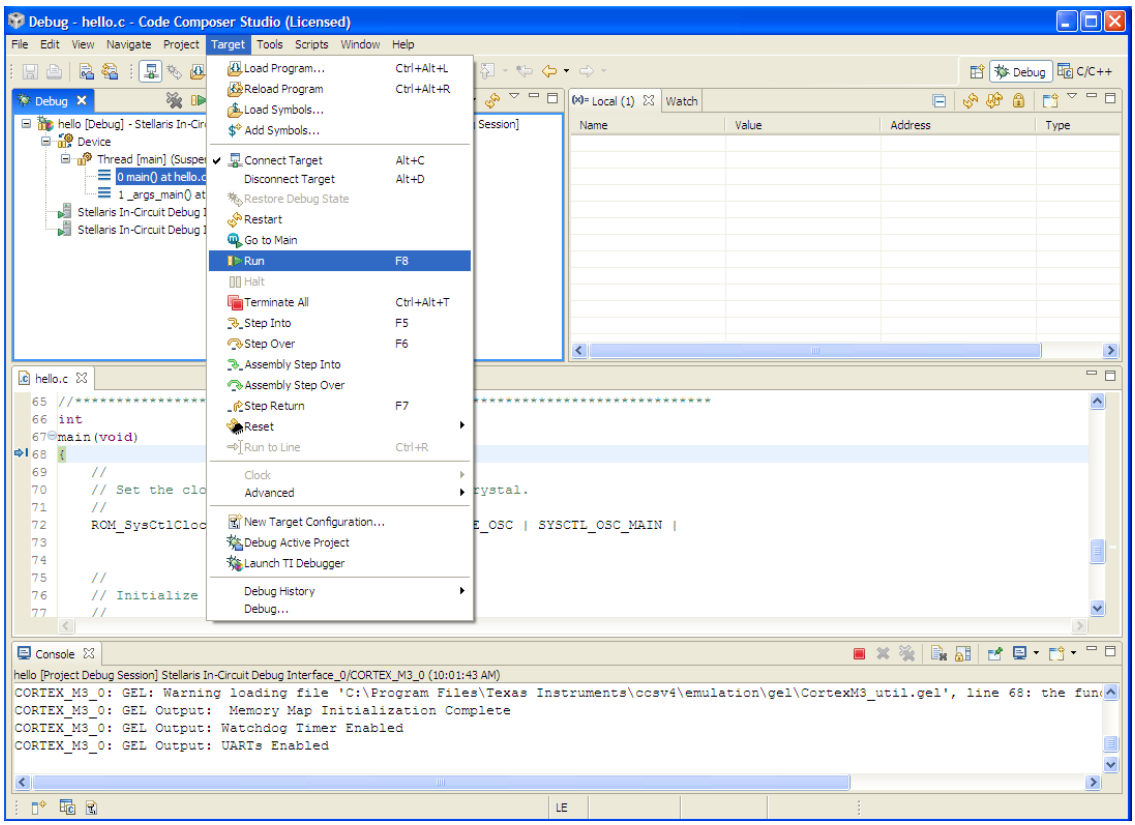
3. On the menu bar, click on **Target** and select **Debug Active Project**. Alternatively, you can simply click the **Debug Launch** icon on the menu bar.



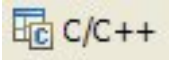
Code Composer Studio should switch to the **Debug Perspective**. If it does not, click the **Debug Perspective** button Debug in the upper right.

4. The **Code Composer Studio** debugger automatically connects to your evaluation board, programs the Flash memory, and runs to the beginning of the **`main()`** function. From here, you can examine and modify memory, program variables and processor registers, set breakpoints, step, and perform other typical debugging activities.

   To run the program, select **Run** from the **Target** pull-down menu or click the **Run**  button on the menu bar.



Note the display on your board. If everything has worked properly, you should see **Hello World** on the display. Don't worry about the preprogrammed application that came with the board, we'll re-flash it in the **Flash Programmer** section later.

Click the 

C/C++ Perspective button in the upper right of your display to return to the editor perspective.

Right-click on **hello** in the **Project pane** and select **Close Project** from the list.

If you are not going to run the next lab section, **Close** Code Composer Studio now.

Optional!

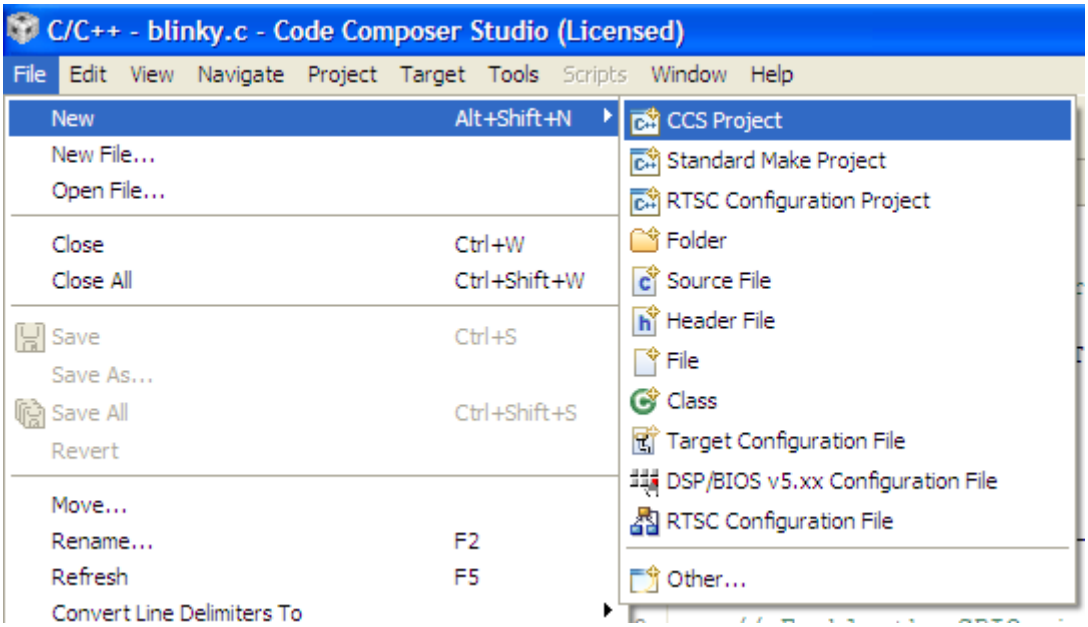
The following section should only be attempted if you have sufficient time to complete it. Let your instructor know that you're ready to start this section. Otherwise, you can complete it at home.

Creating a New Project

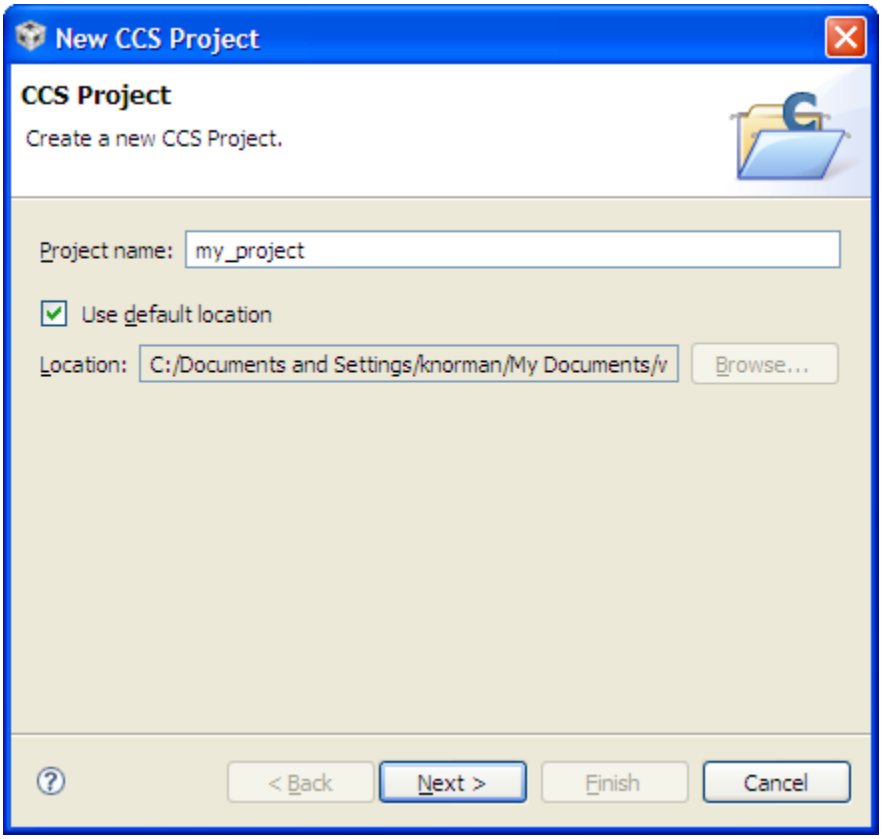
Once you have gone through the StellarisWare example applications, you may want to create your own project to begin development. While you can always start with an existing, simple project, sometimes you may want to start fresh.

The example provided below creates a fresh project, copies code from an existing project, and builds the new project.

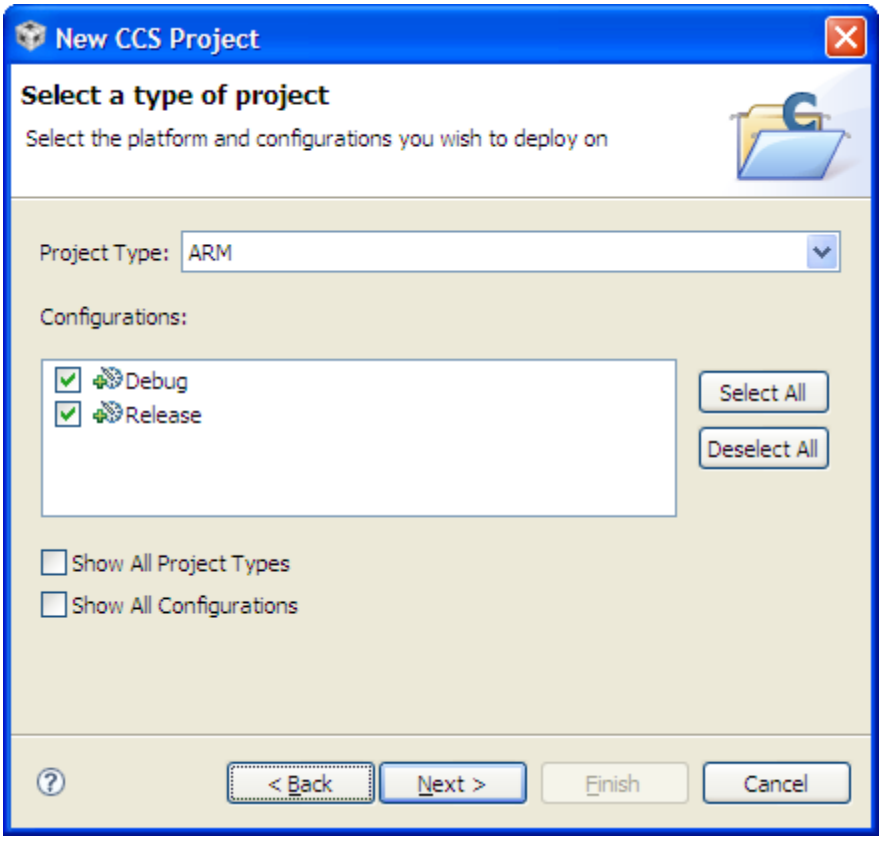
1. To add a new project to your workspace, go to **File → New → CCS Project**.



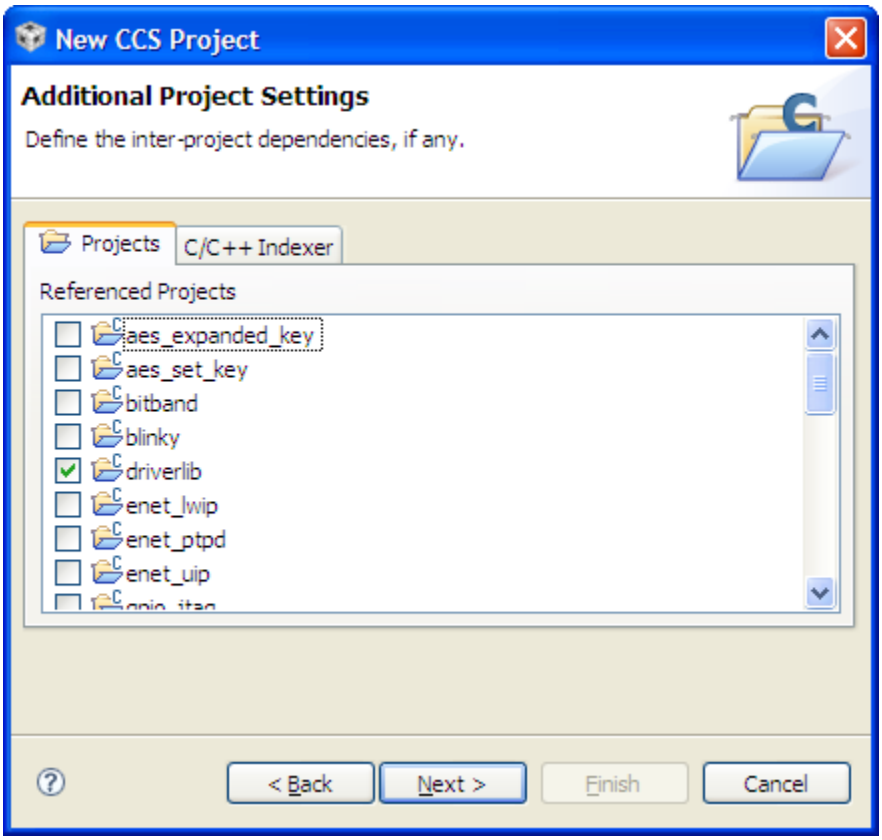
2. **Code Composer Studio** prompts you with a dialog asking you to name the project (how about **my_project**) and specify the location of the project. Name your project, specify the location (your default workspace will do), and click **Next**.



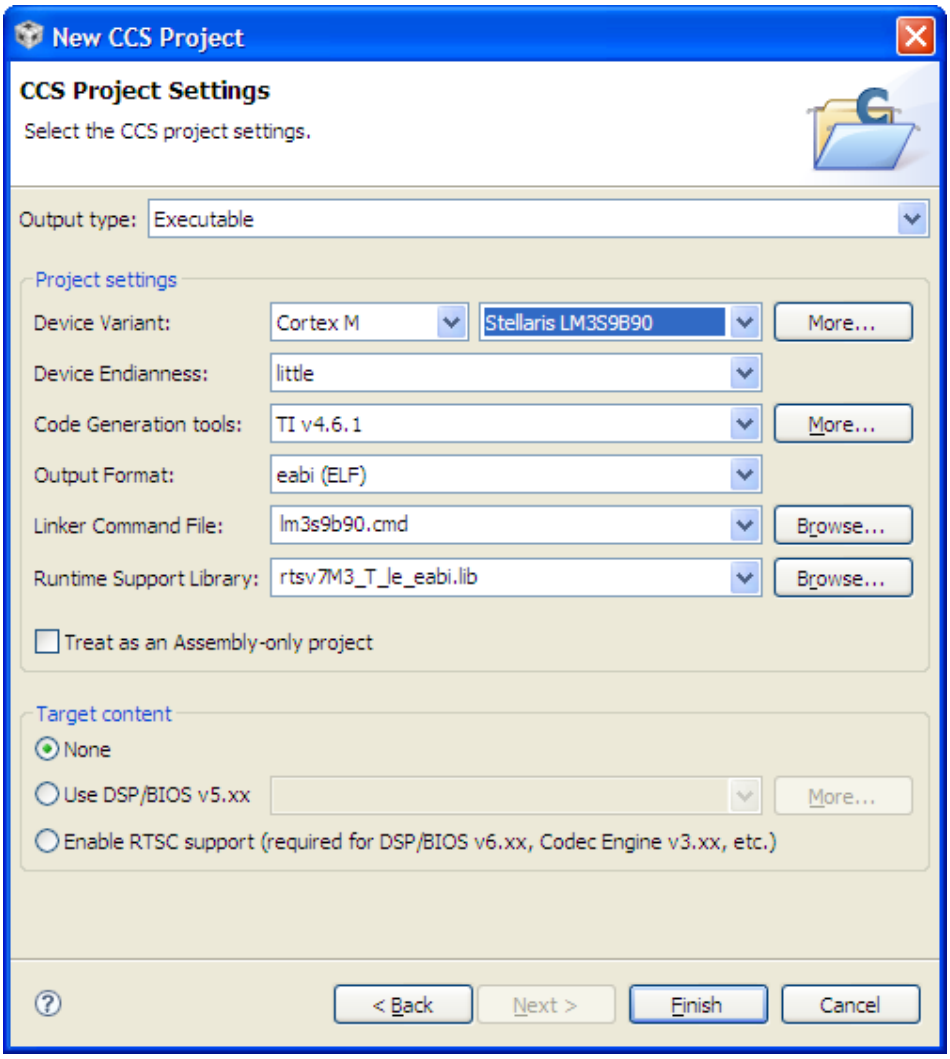
3. The next dialog asks for the project type and configurations. Select **ARM** as the project type, check both the **Debug** and **Release** configurations, and click **Next**.



4. The next dialog allows you to define any inter-project dependencies. If your project will be using **driverlib**, **usblib**, or **grlib**, now is a good time to define that dependency. **Select** those libraries and click **Next**.

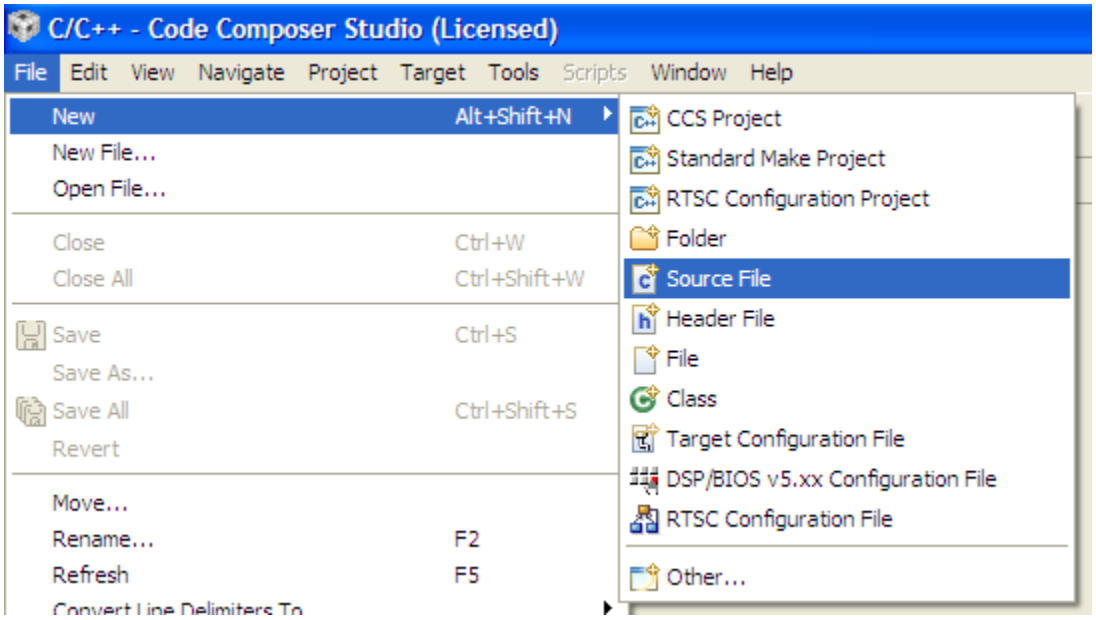


5. On the next dialog, select the appropriate **Stellaris device**, **little endian**, the **TI code generation tool**, **ELF output format**, and the **rtsv7M3_T_le_eabi.lib runtime library**. Click **Finish**.

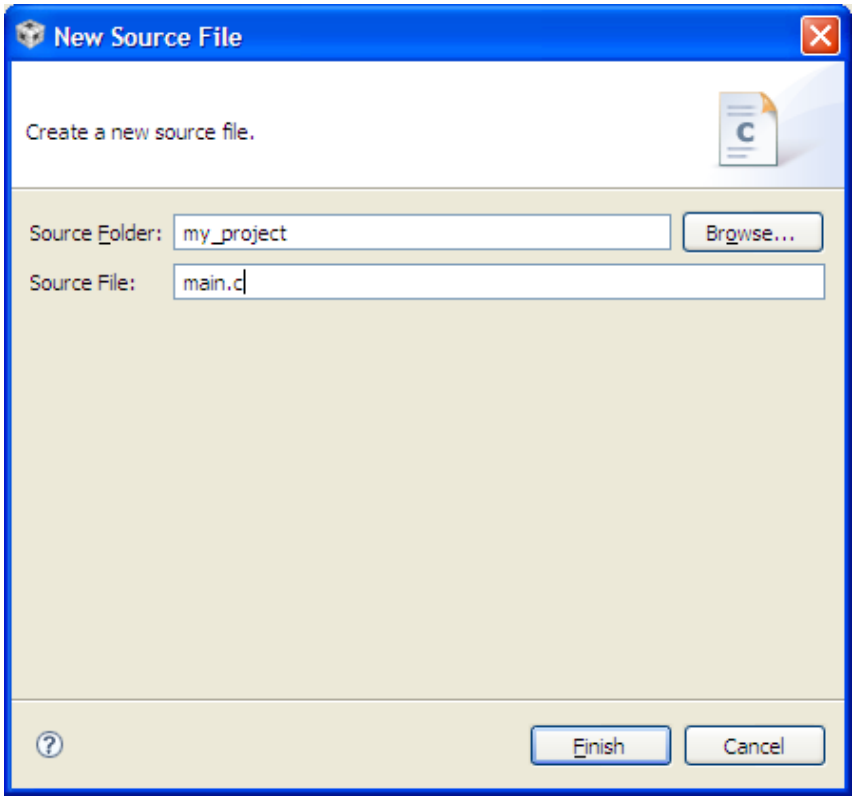


6. A new project has now been created, but the project does not include any source code. The next step is to add some startup code to the project. Using Windows Explorer, copy the **startup_ccs.c** file from an existing example directory in StellarisWare (such as **C:\StellarisWare\boards\<board>\blinky**) to your new project directory created in step 2 above (in your **My Documents** folder).

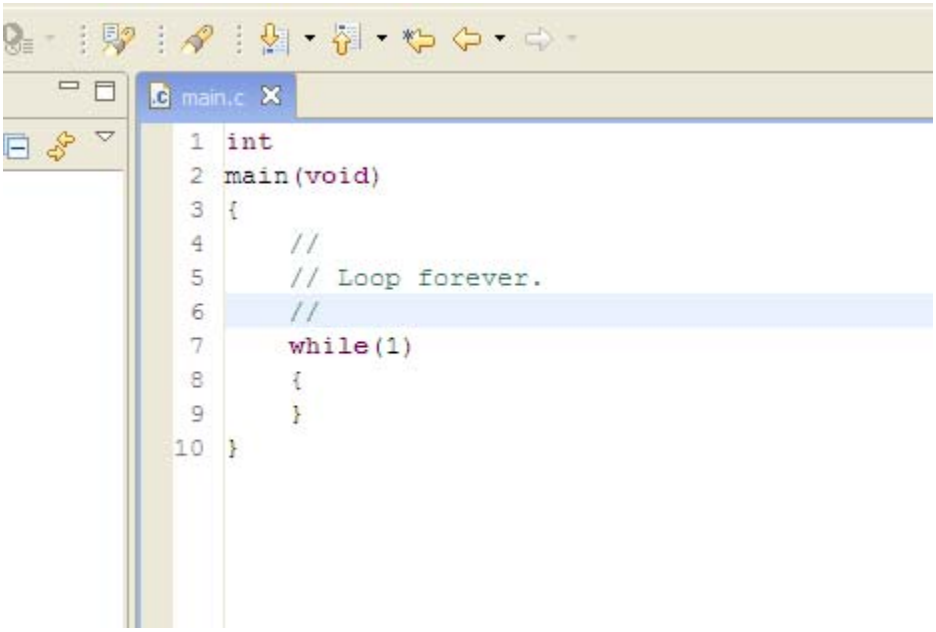
7. Create a new C source file by going to **File → New → Source File**.



8. In the dialog box that pops up, name the file **main.c** and click **Finish**.



9. **Code Composer Studio** will open the **main.c** file for editing. Add a **main()** function to **main.c** as shown below. **Save** the file by clicking the  **Save** button.

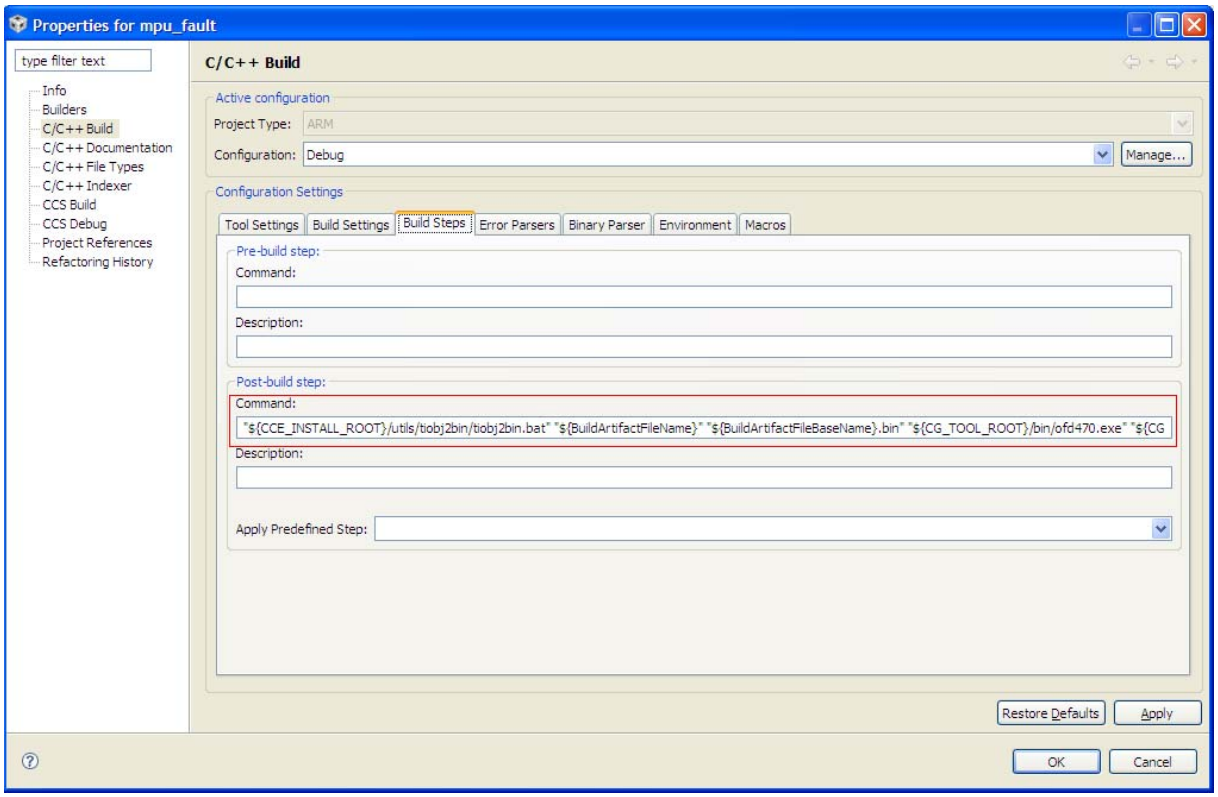


10. Both files, **main.c** and **startup_ccs.c**, should have automatically been added to the project. If not, **right-click** on **my_project** in the Project pane, select **Add Files to Project** and browse to the files.

11. **Build** the new project by selecting **Project → Rebuild Active Project**.

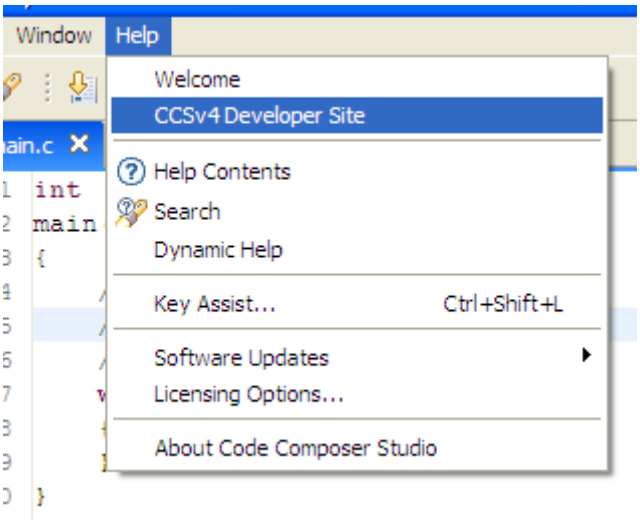
With your project created, all you really need to do is add your own code. Use the existing StellarisWare board examples as a reference.

NOTE: To set up your project to output a binary file (**.bin**) to be used with tools such as **LM Flash Programmer**, copy the post-build step from an existing StellarisWare example project.



Conclusion

You have now installed the Code Composer Studio development tools and used them to build and load an example application on your Stellaris Evaluation Board. From here, you can experiment with the debugger or start creating your own application using the example projects as a reference. For further information on Code Composer Studio, go to the CCS Developer Site.



Close Code Composer Studio now.

References

The following references are included on the Stellaris Evaluation Kit Documentation and Software DVD and are also available for download at www.ti.com/Stellaris:

- *Stellaris Evaluation Kit User's Manual*
- *StellarisWare Software*, Order Number SW-LM3S
- *StellarisWare Peripheral Driver Library User's Guide*, Order Number SW-DRL-UG

In addition, the following website may be useful:

- Code Composer Studio website at http://www.ti.com/ccstudio

QUICKSTART – CODE COMPOSER STUDIO