

QUICKSTART – CODE RED TECHNOLOGIES

Stellaris® Development and Evaluation Kits for Red Suite

The Stellaris Development and Evaluation Kits provide a low-cost way to start designing with Stellaris microcontrollers using Code Red Technologies' Red Suite development tools. The 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 Stellaris Evaluation Kit Documentation and Software CD or the standalone Code Red CD found in the Development Kit



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.

Red Suite

This quickstart shows you how to install the Red Suite development tool and how to use it to build and run an example application on your Stellaris Evaluation Board.

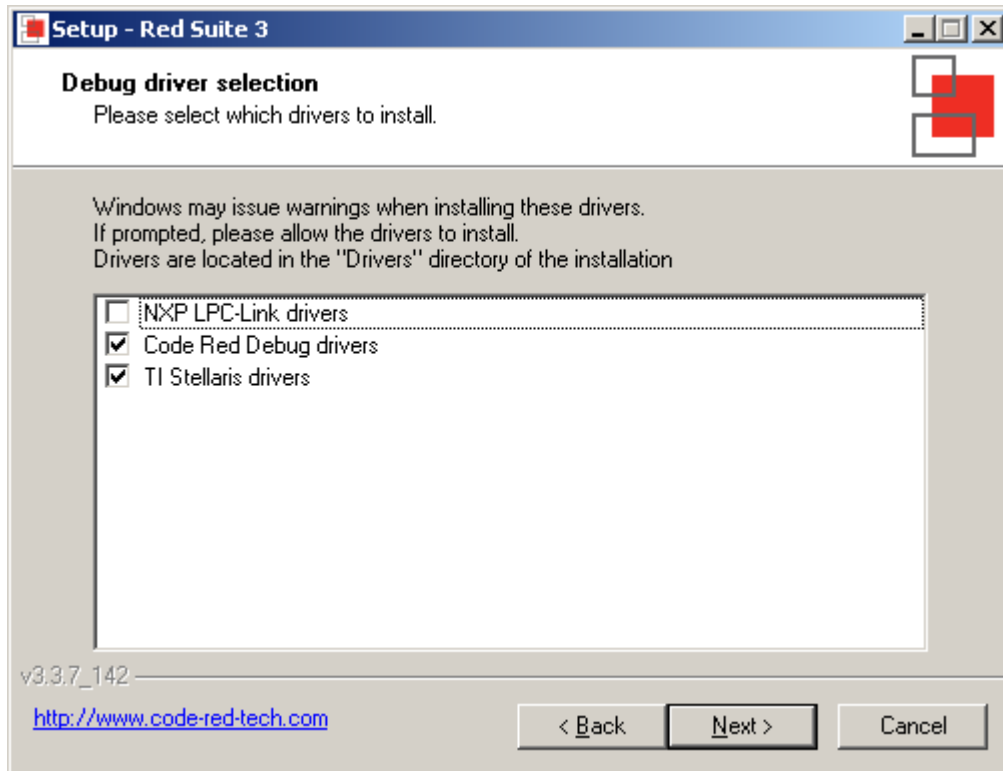
Step 1: Install Red Suite

1. Insert the Evaluation Kit Documentation and Software CD or the standalone Code Red CD into the CD-ROM drive of your computer. If Autoplay is enabled on your PC, the index.htm file is opened automatically in your default web browser. If Autoplay is not enabled, use Windows Explorer to open the CD manually.
2. With the Evaluation Kit CD, click the Tools button and then click the Code Red logo to start the setup program. If the setup program does not start, use Windows Explorer to view the files on the CD and double-click the red_suite_n.n.n.exe file located in the "Tools\Code Red\" directory.

With the standalone CD, follow the installer dialog.

QUICKSTART – CODE RED TECHNOLOGIES

3. Follow the instructions in the Red Suite installation program. When you get to the Debug Driver Selection window, deselect the “NXP LPC-Line drivers” by clicking the checkbox. After you have clicked the checkbox, the window should look like this:



4. Click the Next button to continue with the installation.
5. Red Suite continues to install into a single directory of your choice. Unlike many software packages, Red Suite does not install or use any keys in the Windows Registry, or use or modify any environment variables (including PATH), which results in a clean installation that does not interfere with anything else on your PC.

QUICKSTART – CODE RED TECHNOLOGIES

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 Red. To install StellarisWare components, follow these steps:

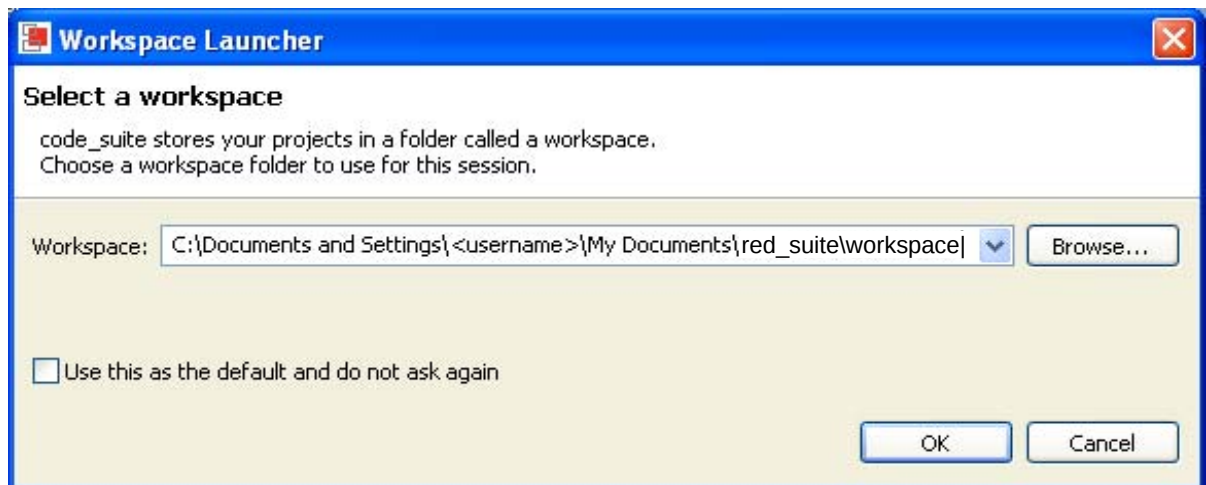
1. Navigate to the *Tools* tab on the Evaluation Kit Documentation and Software CD, or to the *Software* tab on the Development Kit Documentation and Software CD.

NOTE: If you are navigating the CD using Windows Explorer (or a similar application), go to the Tools/StellarisWare or Software/StellarisWare directories.

2. Click on the 'Install' link next in the StellarisWare section (under Tools or Software) of the CD and run the StellarisWare installer. If you prefer to manually install StellarisWare, the installer is a self-extracting zip file that is located in the Tools/StellarisWare directory. You can use a zip file extraction utility such as WinZip to manually extract the contents.
3. To view the StellarisWare documentation, navigate to the installation directory and click on the *Stellaris Software User's Guide* PDF.

Step 3: Start Red Suite and Open a Workspace

1. Start the Red Suite IDE by selecting it from the Windows Start menu or clicking the Red Suite 2 icon installed on your desktop. When the IDE loads, it will ask you where to open the workspace folder:



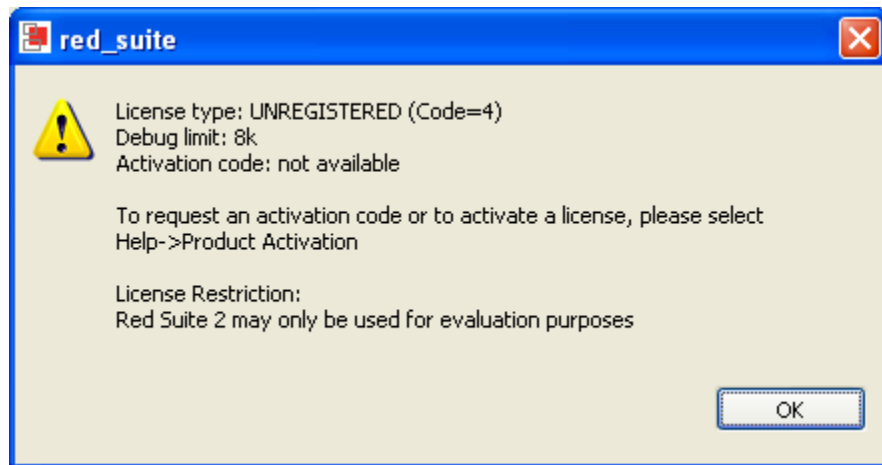
2. The Workspace launcher defaults to the following path:

QUICKSTART – CODE RED TECHNOLOGIES

C:\Documents and Settings\<username>\My Documents\red_suite\workspace

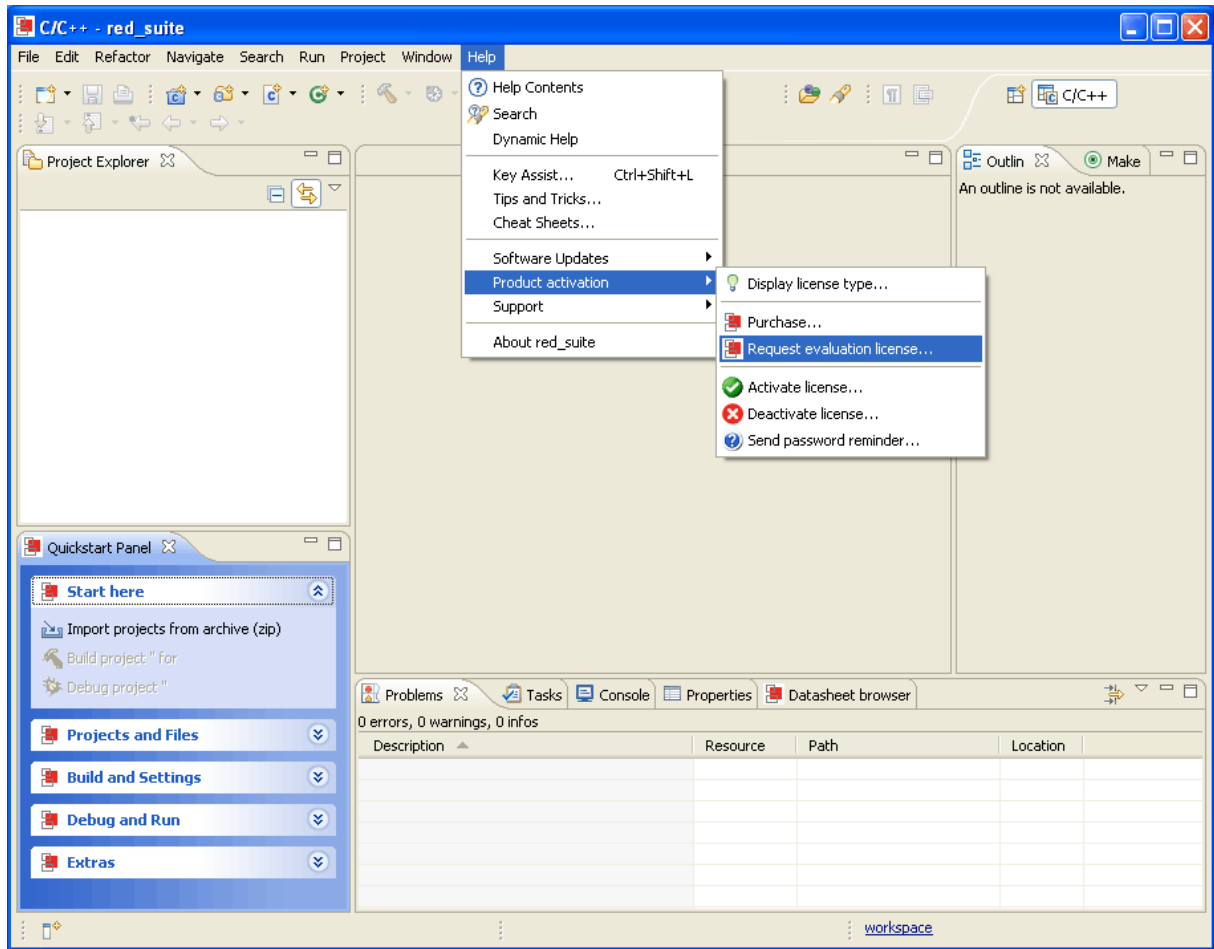
Click OK to use this default workspace location.

3. If this is the first time you have run the Red Suite IDE, a dialog box may appear like the one shown below. If the dialog appears, click OK to continue.



4. The Red Suite IDE now opens with an empty workspace. Go to “Help > Product activation” to request and activate your evaluation license.

QUICKSTART – CODE RED TECHNOLOGIES



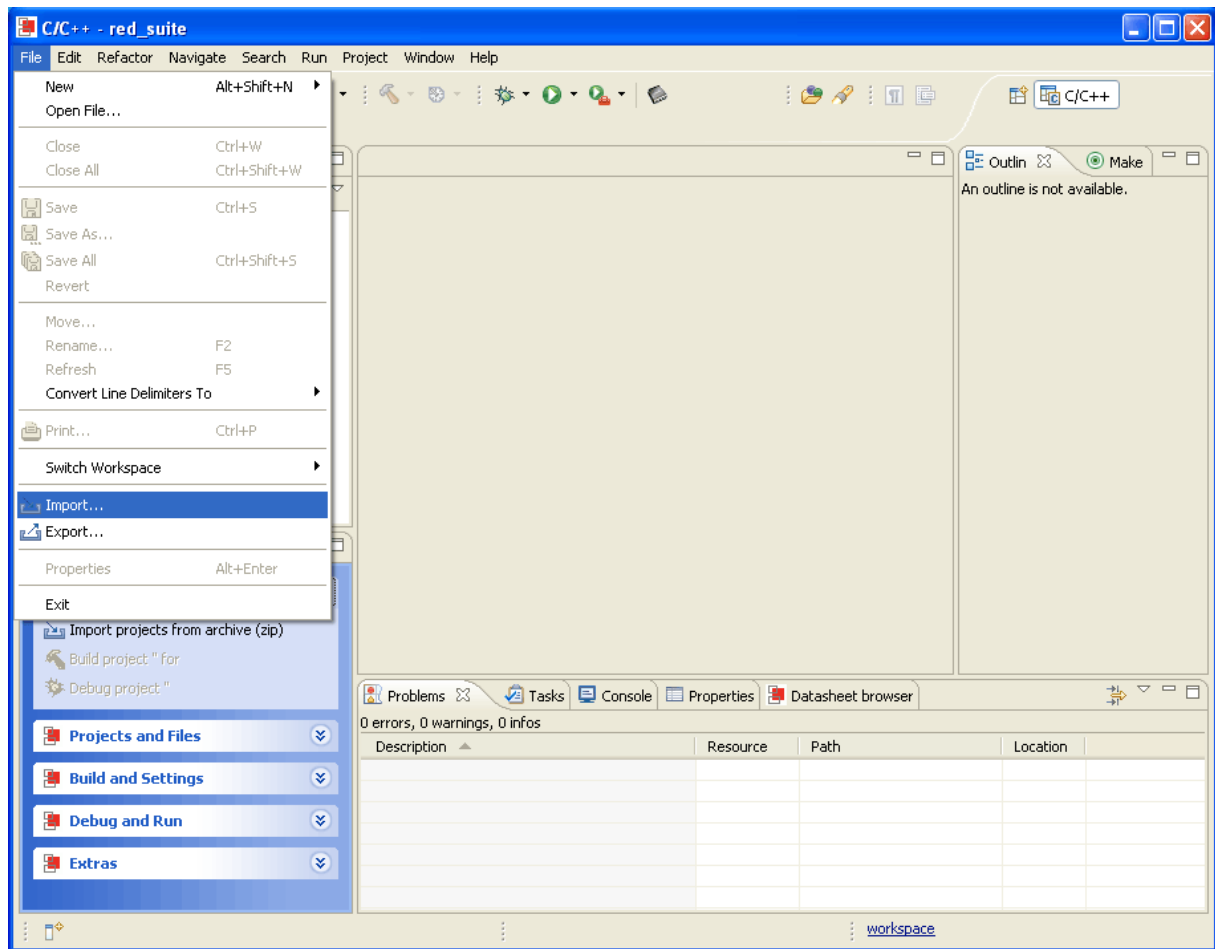
5. Follow the instructions to obtain and activate your evaluation license.

Important: For the most recent version of the StellarisWare workspaces, check the www.ti.com/stellaris web site for the latest software updates.

Step 4: Import and Build Example Projects

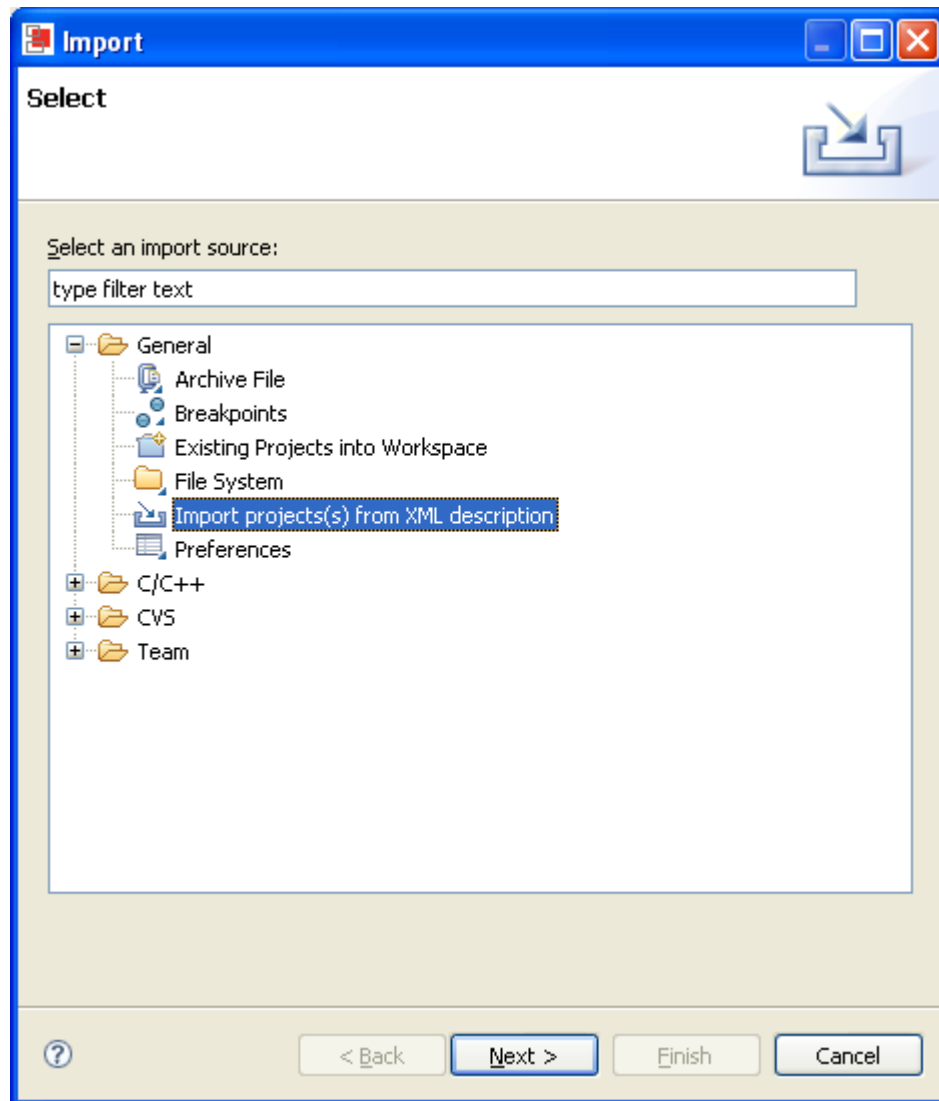
1. Select the “Import...” option from the File menu in Red Suite.

QUICKSTART – CODE RED TECHNOLOGIES



QUICKSTART – CODE RED TECHNOLOGIES

2. Another dialog box appears to let you select what to import. Click “General” to expand all of the options and then click “Import project(s) from XML description.” Click the Next button when you are finished.



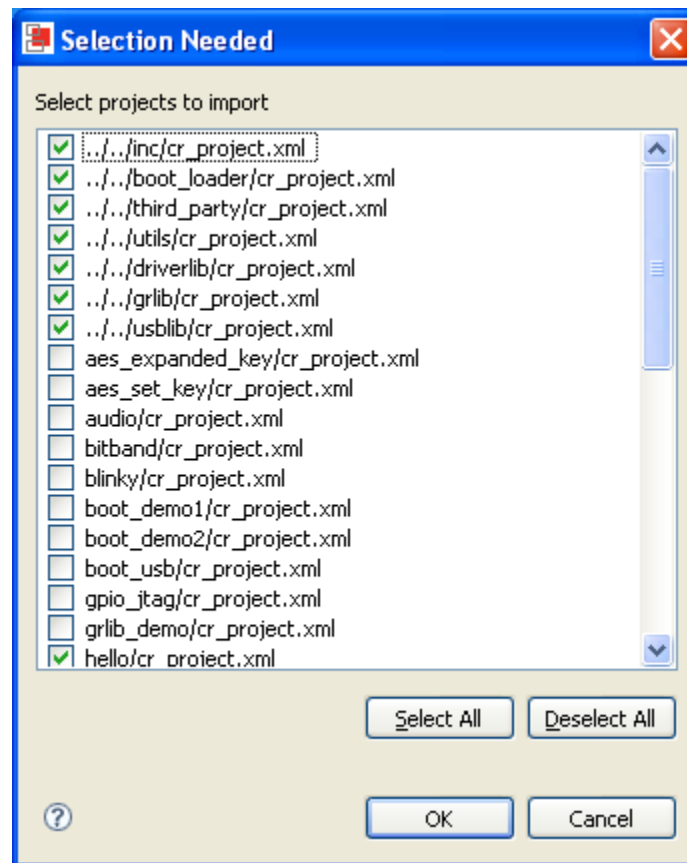
QUICKSTART – CODE RED TECHNOLOGIES

3. On the next screen, browse to locate an XML file. The XML description files are located in the StellarisWare installation from Step 2, which by default is C:/StellarisWare. From here, the XML file is located in:

StellarisWare\boards\{board_name}

Select the cr_workspace.xml file and click on “Open”. Then click “Finish”.

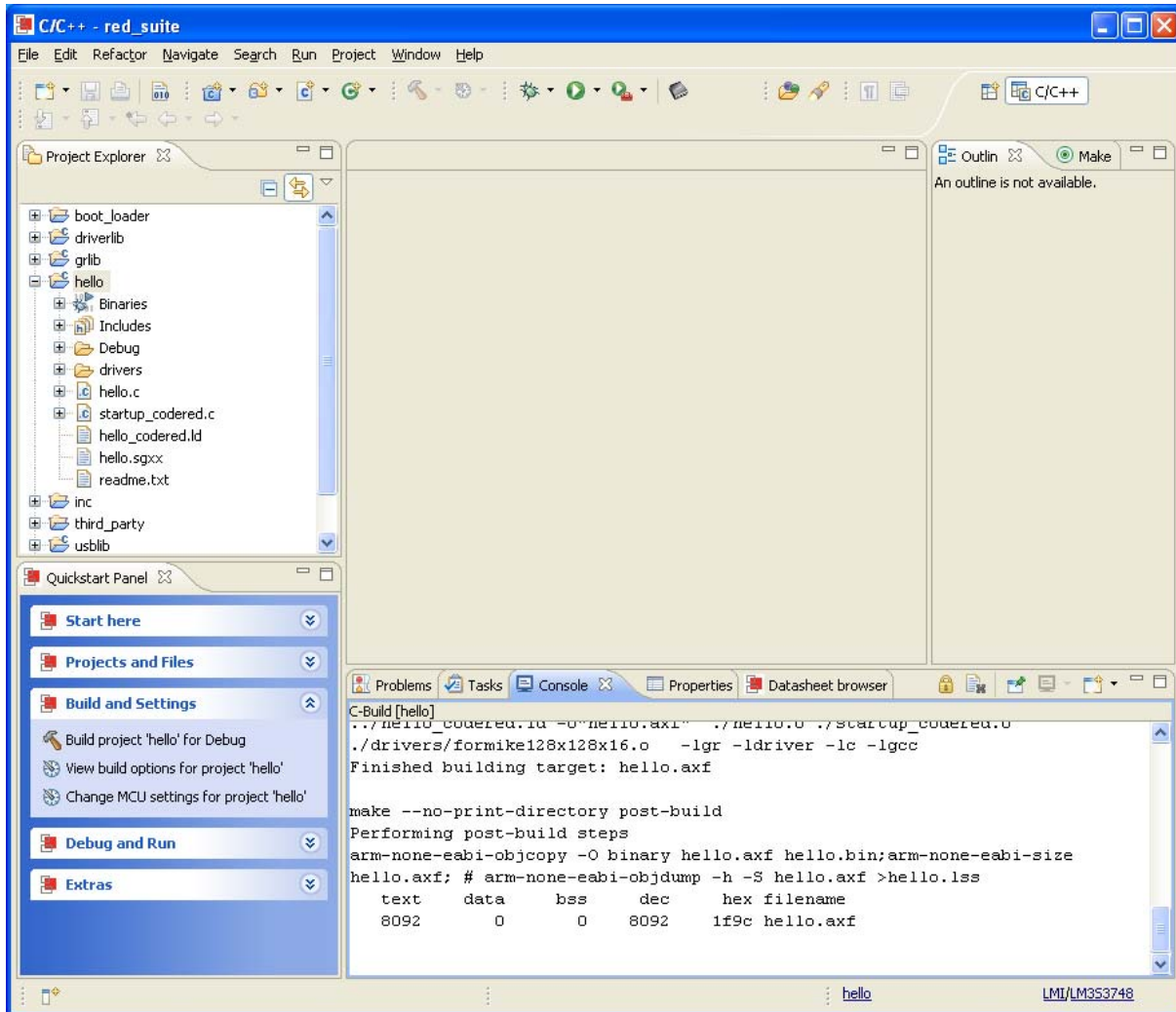
4. A new window opens containing all of the available projects for your board. You can import them all to your workspace or select only the examples that you want. If you choose to select only a few examples, the top items must also be imported. These are the StellarisWare library projects, third-party applications, and utilities directories that some projects have dependencies on. In this example, you will only import the “hello” project.



With the projects selected, click “OK.” The projects are then imported to your workspace and built.

QUICKSTART – CODE RED TECHNOLOGIES

5. You will now see the projects listed in the Project Explorer. The projects will automatically start to build. Wait for the projects to finish building before continuing.



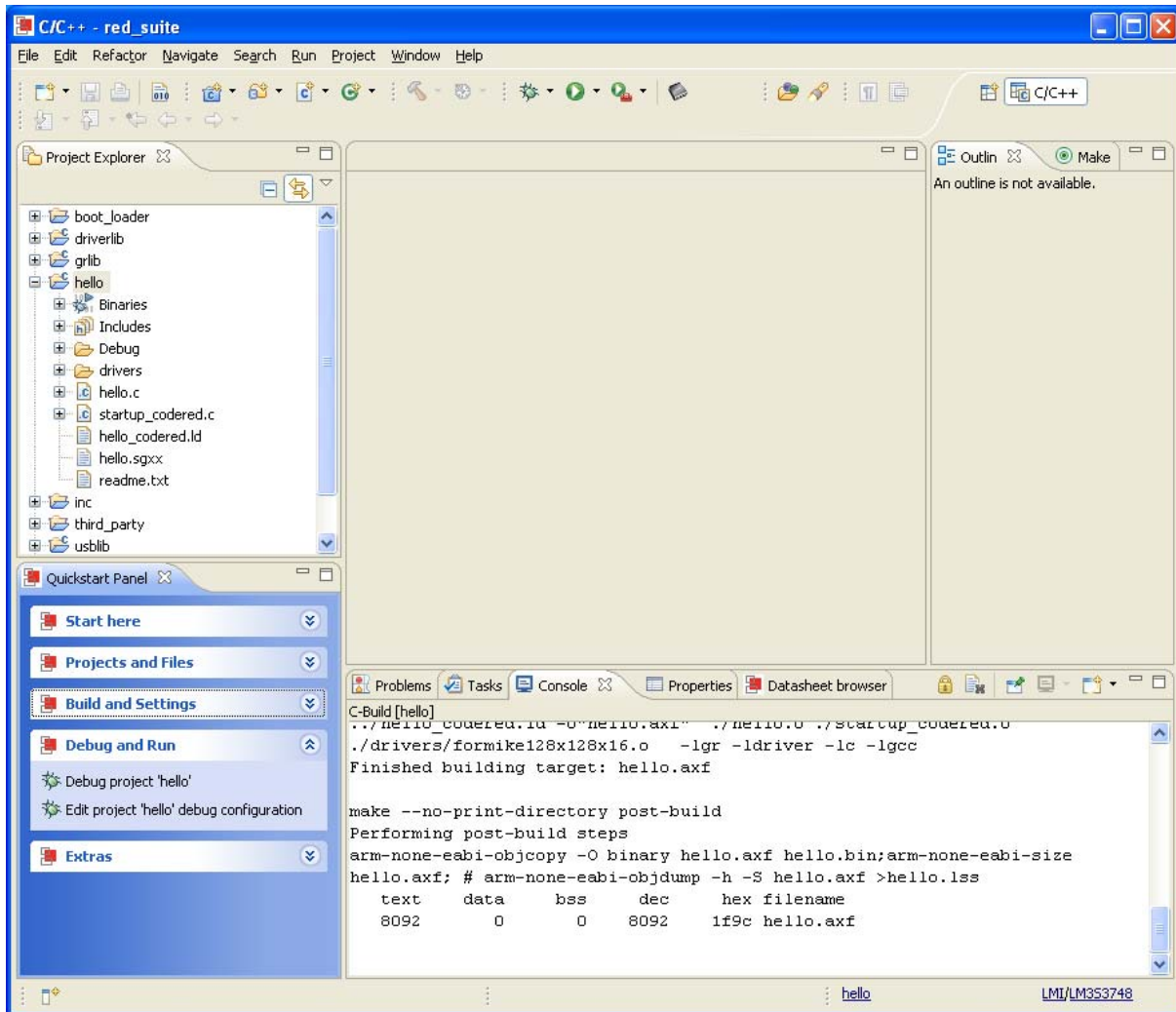
6. To rebuild an individual project, select the project you want to build by clicking an item in the Project Explorer list. From the “Build and Settings” section of the Quickstart Panel in the bottom left of the Red Suite window, click “Build project ‘<name>’ for Debug.” If this option is not visible, expand the “Build and Settings” section by clicking on the downward pointing arrows to the right of the title.

Step 5: Debugging a Project

1. You will have several example projects from which to choose for your evaluation board. For an example, start with the hello project. Select the “hello” project in the

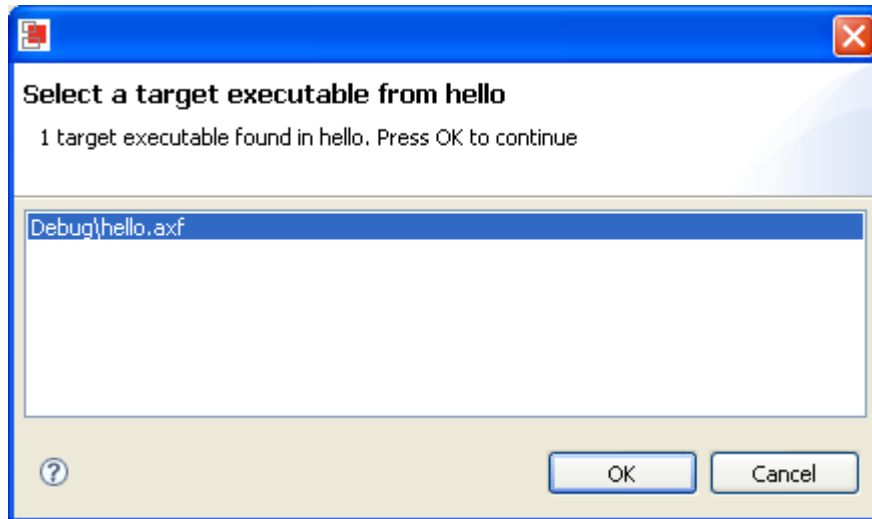
QUICKSTART – CODE RED TECHNOLOGIES

Project Explorer pane then click “Debug project ‘hello’” from the “Debug and Run” section of the Quickstart Panel.



QUICKSTART – CODE RED TECHNOLOGIES

2. You will be asked to select the executable to debug. Choose “Debug\hello.axf” then press OK.

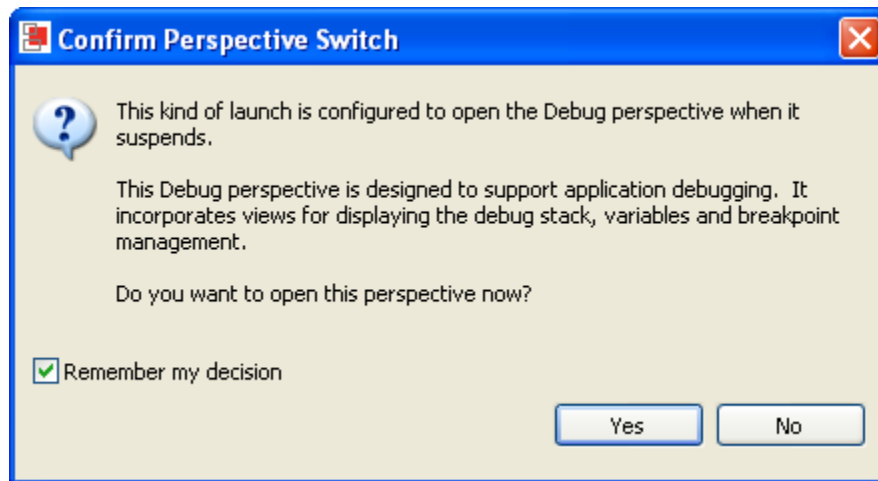


3. You may get the Windows Security Alert pop-up shown below. Click the Unblock button to continue. This is necessary for proper operation of the debugging interface.



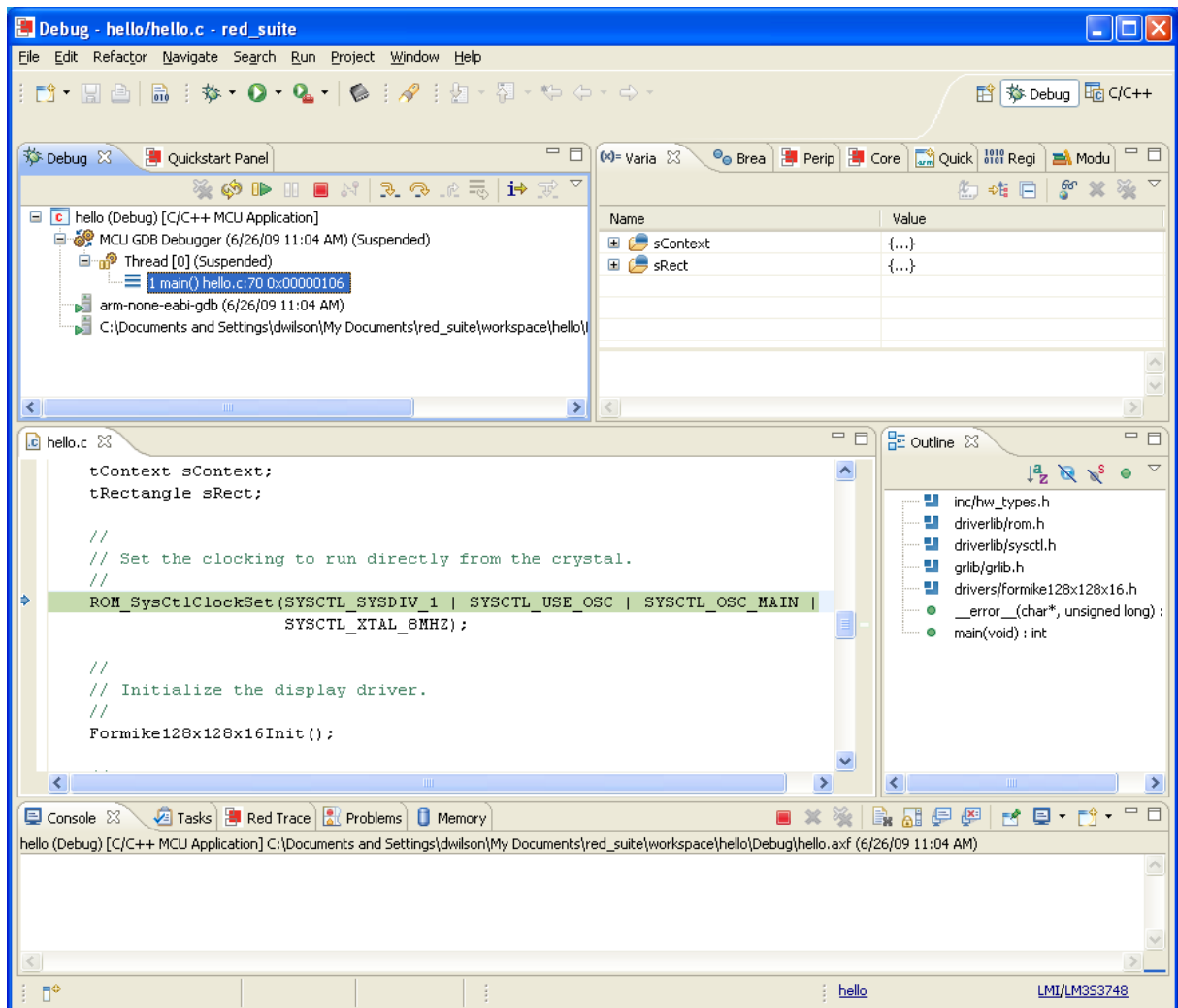
4. If this is the first time you have used the debugger, Red Suite will also prompt you to confirm your prospective switch. Click the Yes button to continue.

QUICKSTART – CODE RED TECHNOLOGIES



QUICKSTART – CODE RED TECHNOLOGIES

5. The Red Suite debugger automatically connects to your evaluation board, programs the flash, 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 other typical debugging activities. To run the program, select “Resume” from the Run menu.



6. The application starts running, and you should see the text “Hello World!” output to the display of the evaluation board.

Step 6: Build and Run Additional Example Programs

There are several additional example projects listed in workspace. If you would like to build another example project, follow the above instructions to import the different projects into the workspace. The quickstart application that came preloaded on the evaluation board is the `qs_XXXXX` project listed with the examples.

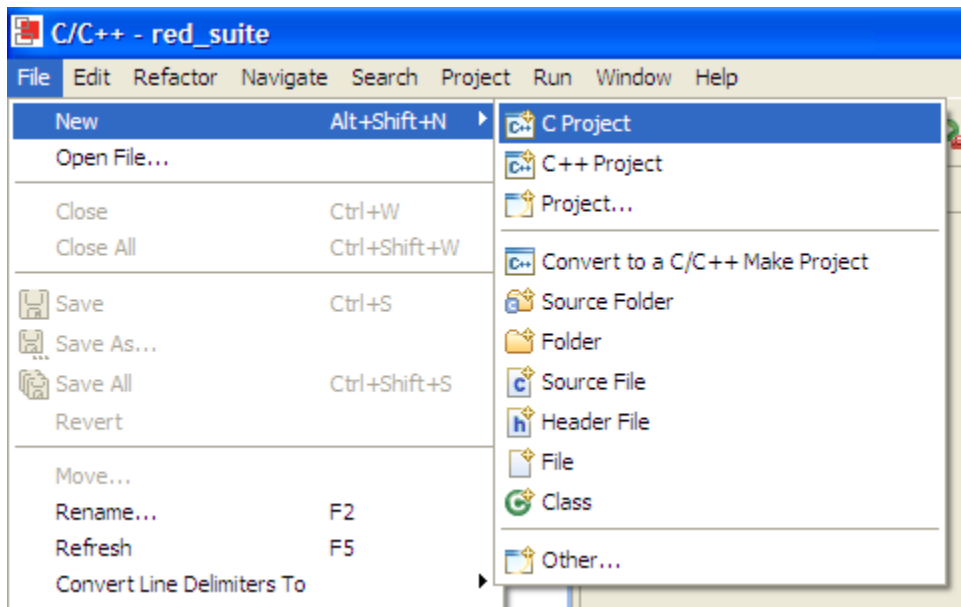
QUICKSTART – CODE RED TECHNOLOGIES

Creating a New Project

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

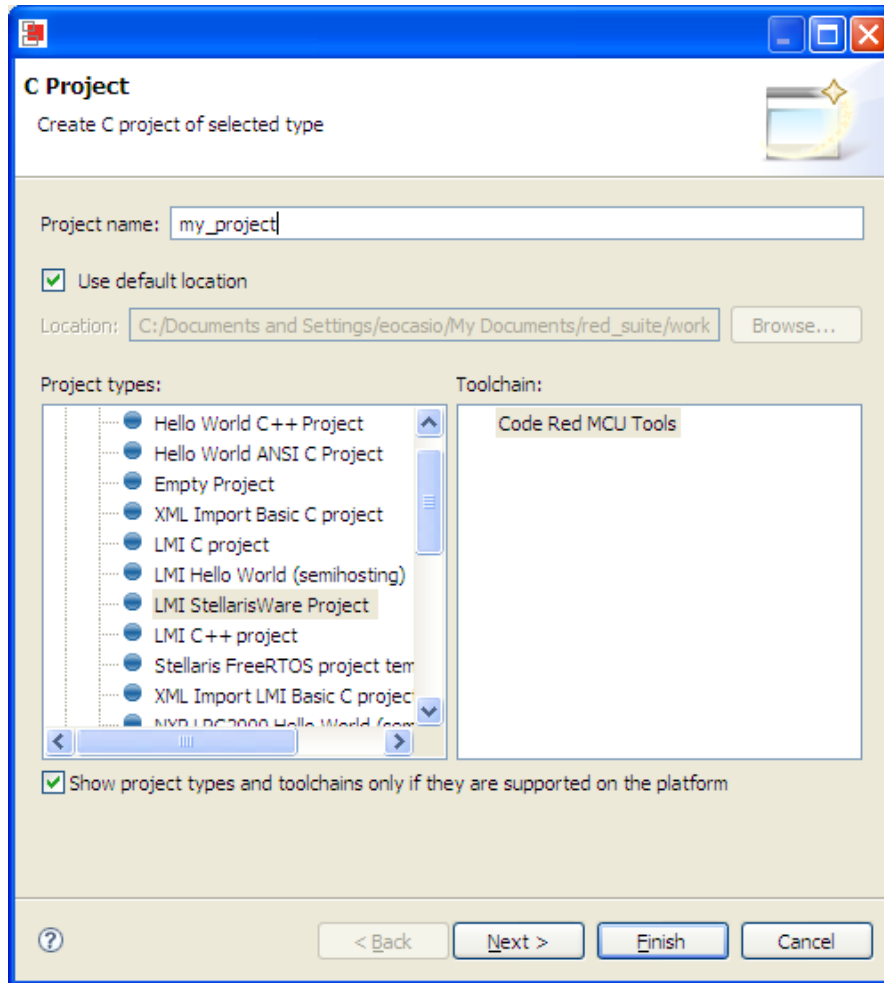
The Code Red tools have a very nice project wizard that lets you create a variety of different project types, with all of the necessary hooks to StellarisWare. It also completely sets up the debug interface so that all you need to do is start writing software, without worrying about setting up your project correctly.

To add a new project to your workspace (assuming you're still using the example described above), go to File > New > C Project.



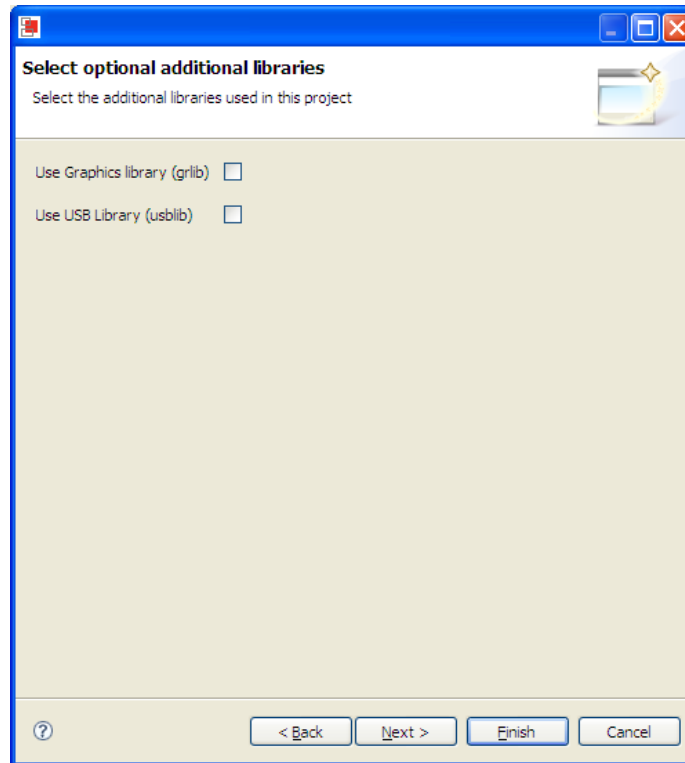
Red Suite will prompt you with a dialog box asking for the type of project you want to create. You'll focus on the executable project types for this example. In this list, you have 6 options for Stellaris microcontrollers. The simplest one to start with is the "LMI StellarisWare Project" because it provides all of the necessary hooks to StellarisWare drivers.

QUICKSTART – CODE RED TECHNOLOGIES

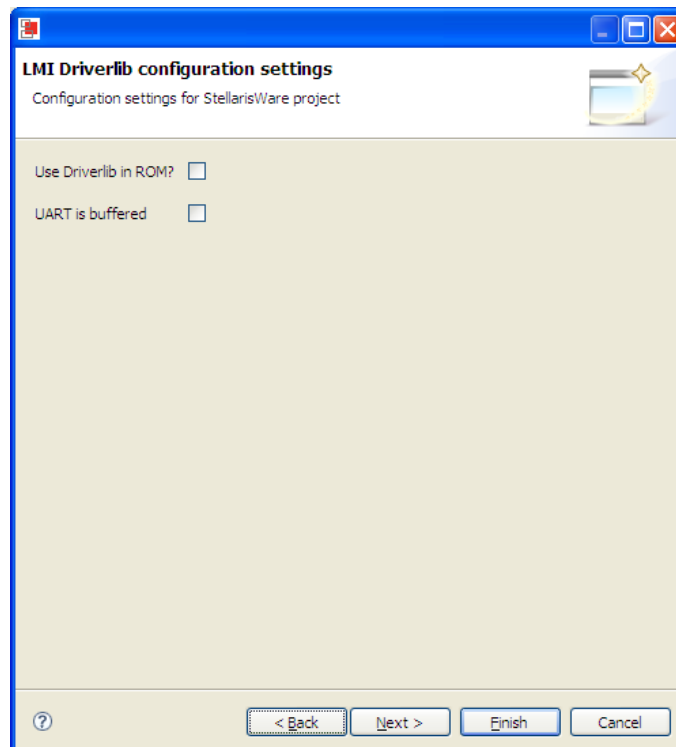


Here, let's create a new project called "my_project". If you click Next, the tool will give you the option to automatically set up the hooks into the StellarisWare Graphics Library and USB Library if you need them. The default configuration (if you were to just click Finish instead of Next) sets all of these up for you.

QUICKSTART – CODE RED TECHNOLOGIES

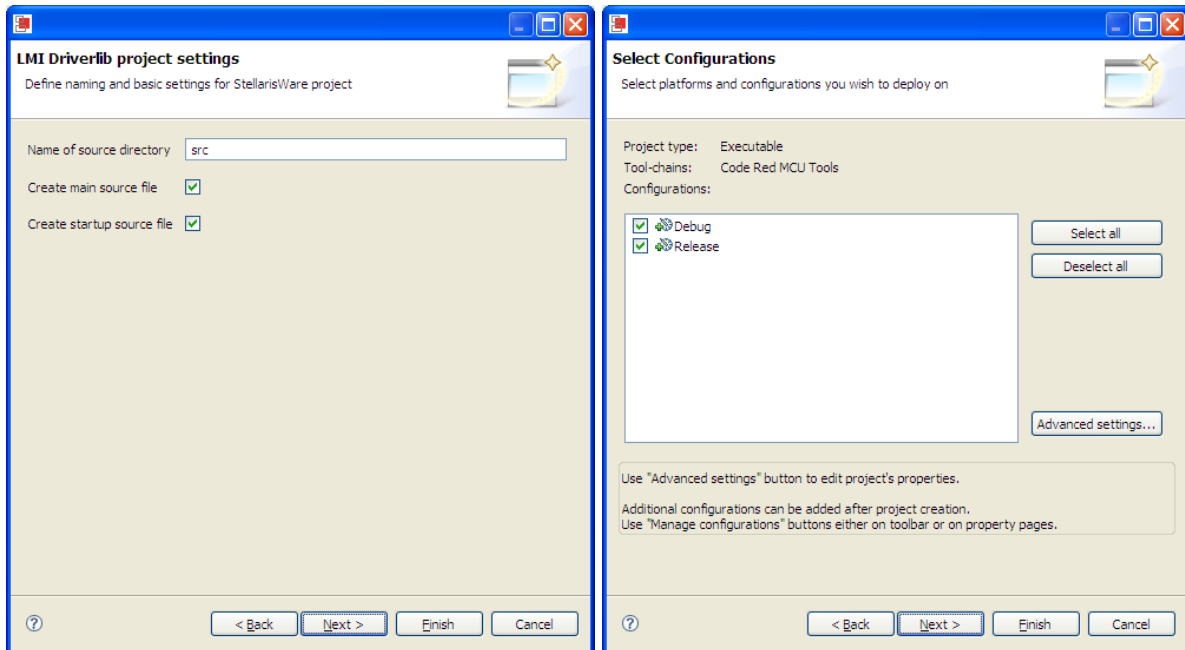


Clicking Next again lets you choose whether to use DriverLib in ROM (if your device supports it), and if you would like to use a buffered (FIFO enabled) UART.



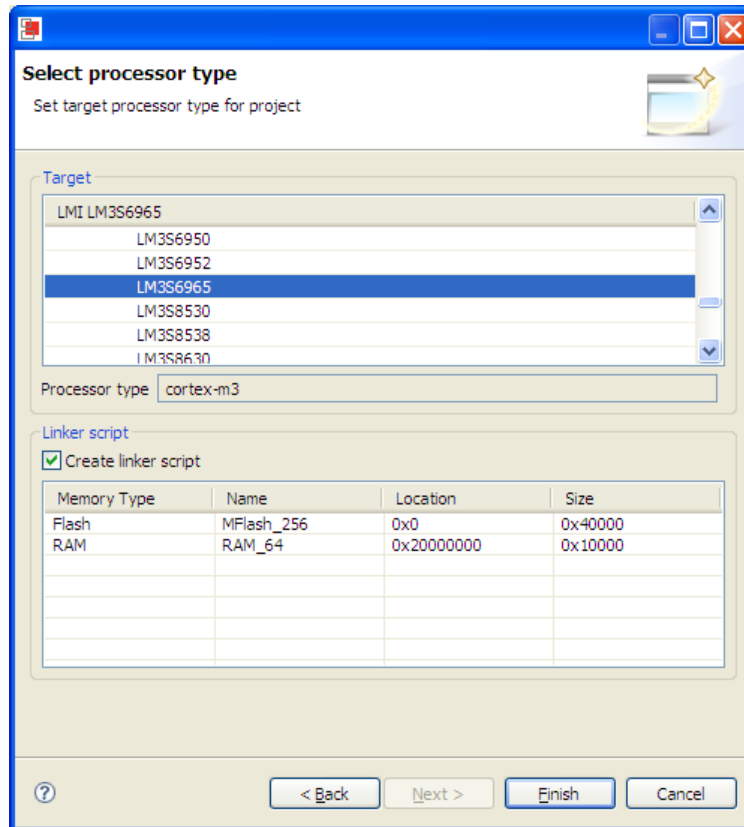
QUICKSTART – CODE RED TECHNOLOGIES

You can then select the name of your source directory and choose whether or not you'd like the tool to create a main.c file and startup code for you. We suggest letting the tool do it to make it easy for you. You can also choose to create both Debug and Release versions of your code.



Lastly, you select the device you're using.

QUICKSTART – CODE RED TECHNOLOGIES



With your project created, all you really need to do is add your code. The main.c file created for you already sets up the system clock and includes the header files to use the System Control module of the DriverLib. From here, you're ready to go!

Conclusion

You have now installed the Red Suite 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 projects as examples. Red Suite has many powerful features to help you develop embedded applications. For further information on Red Suite, start with the "Red Suite Quickstart Guide" installed with the Red Suite tools.

QUICKSTART – CODE RED TECHNOLOGIES

References

The following references are included on the Stellaris Evaluation Kit Documentation and Software CD 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 Red Technologies website at <http://www.code-red-tech.com>

Copyright © 2009-2010 Texas Instruments, Inc. All rights reserved. Stellaris and StellarisWare are registered trademarks of Texas Instruments. ARM and Thumb are registered trademarks, and Cortex is a trademark of ARM Limited. Other names and brands may be claimed as the property of others.

Texas Instruments
108 Wild Basin Rd., Suite 350
Austin, TX 78746
<http://www.ti.com/stellaris>



IMPORTANT NOTICE

Texas Instruments Incorporated and its subsidiaries (TI) reserve the right to make corrections, modifications, enhancements, improvements, and other changes to its products and services at any time and to discontinue any product or service without notice. Customers should obtain the latest relevant information before placing orders and should verify that such information is current and complete. All products are sold subject to TI's terms and conditions of sale supplied at the time of order acknowledgment.

TI warrants performance of its hardware products to the specifications applicable at the time of sale in accordance with TI's standard warranty. Testing and other quality control techniques are used to the extent TI deems necessary to support this warranty. Except where mandated by government requirements, testing of all parameters of each product is not necessarily performed.

TI assumes no liability for applications assistance or customer product design. Customers are responsible for their products and applications using TI components. To minimize the risks associated with customer products and applications, customers should provide adequate design and operating safeguards.

TI does not warrant or represent that any license, either express or implied, is granted under any TI patent right, copyright, mask work right, or other TI intellectual property right relating to any combination, machine, or process in which TI products or services are used. Information published by TI regarding third-party products or services does not constitute a license from TI to use such products or services or a warranty or endorsement thereof. Use of such information may require a license from a third party under the patents or other intellectual property of the third party, or a license from TI under the patents or other intellectual property of TI.

Reproduction of TI information in TI data books or data sheets is permissible only if reproduction is without alteration and is accompanied by all associated warranties, conditions, limitations, and notices. Reproduction of this information with alteration is an unfair and deceptive business practice. TI is not responsible or liable for such altered documentation. Information of third parties may be subject to additional restrictions.

Resale of TI products or services with statements different from or beyond the parameters stated by TI for that product or service voids all express and any implied warranties for the associated TI product or service and is an unfair and deceptive business practice. TI is not responsible or liable for any such statements.

TI products are not authorized for use in safety-critical applications (such as life support) where a failure of the TI product would reasonably be expected to cause severe personal injury or death, unless officers of the parties have executed an agreement specifically governing such use. Buyers represent that they have all necessary expertise in the safety and regulatory ramifications of their applications, and acknowledge and agree that they are solely responsible for all legal, regulatory and safety-related requirements concerning their products and any use of TI products in such safety-critical applications, notwithstanding any applications-related information or support that may be provided by TI. Further, Buyers must fully indemnify TI and its representatives against any damages arising out of the use of TI products in such safety-critical applications.

TI products are neither designed nor intended for use in military/aerospace applications or environments unless the TI products are specifically designated by TI as military-grade or "enhanced plastic." Only products designated by TI as military-grade meet military specifications. Buyers acknowledge and agree that any such use of TI products which TI has not designated as military-grade is solely at the Buyer's risk, and that they are solely responsible for compliance with all legal and regulatory requirements in connection with such use.

TI products are neither designed nor intended for use in automotive applications or environments unless the specific TI products are designated by TI as compliant with ISO/TS 16949 requirements. Buyers acknowledge and agree that, if they use any non-designated products in automotive applications, TI will not be responsible for any failure to meet such requirements.

Following are URLs where you can obtain information on other Texas Instruments products and application solutions:

Products

Amplifiers	amplifier.ti.com
Data Converters	dataconverter.ti.com
DLP® Products	www.dlp.com
DSP	dsp.ti.com
Clocks and Timers	www.ti.com/clocks
Interface	interface.ti.com
Logic	logic.ti.com
Power Mgmt	power.ti.com
Microcontrollers	microcontroller.ti.com
RFID	www.ti-rfid.com
RF/IF and ZigBee® Solutions	www.ti.com/lprf

Applications

Audio	www.ti.com/audio
Automotive	www.ti.com/automotive
Communications and Telecom	www.ti.com/communications
Computers and Peripherals	www.ti.com/computers
Consumer Electronics	www.ti.com/consumer-apps
Energy	www.ti.com/energy
Industrial	www.ti.com/industrial
Medical	www.ti.com/medical
Security	www.ti.com/security
Space, Avionics & Defense	www.ti.com/space-avionics-defense
Video and Imaging	www.ti.com/video
Wireless	www.ti.com/wireless-apps