

Configuring a CodeWarrior for StarCore DSPs Project for the MSC8156EVM Board

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This paper describes how to create a CodeWarrior for StarCore project that is properly configured to utilize the Freescale MSC8156EVM board. It assumes that you have already installed CodeWarrior for StarCore DSPs v10.1.5. For information on installing CodeWarrior, consult the *MSC8156EVM Software Installation Guide*.

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1 Configure the DSP Application with the Wizard

To use the CodeWarrior for StarCore DSPs project wizard to configure a DSP application program for the MSC8156EVM, follow these steps:

1. Launch CodeWarrior for StarCore DSPs and choose **New > StarCore Project**.
The New StarCore Project wizard appears and displays the **Create a StarCore Project** page.
2. Type a descriptive name for the project into the **New Project Name** text box, for example MSC8156_board_test (see [Figure 1](#)). If you require that the project folder be in a location other than the default workspace folder, uncheck the **Use default location** option and click **Browse** to navigate to the desired folder. Click **Next**.

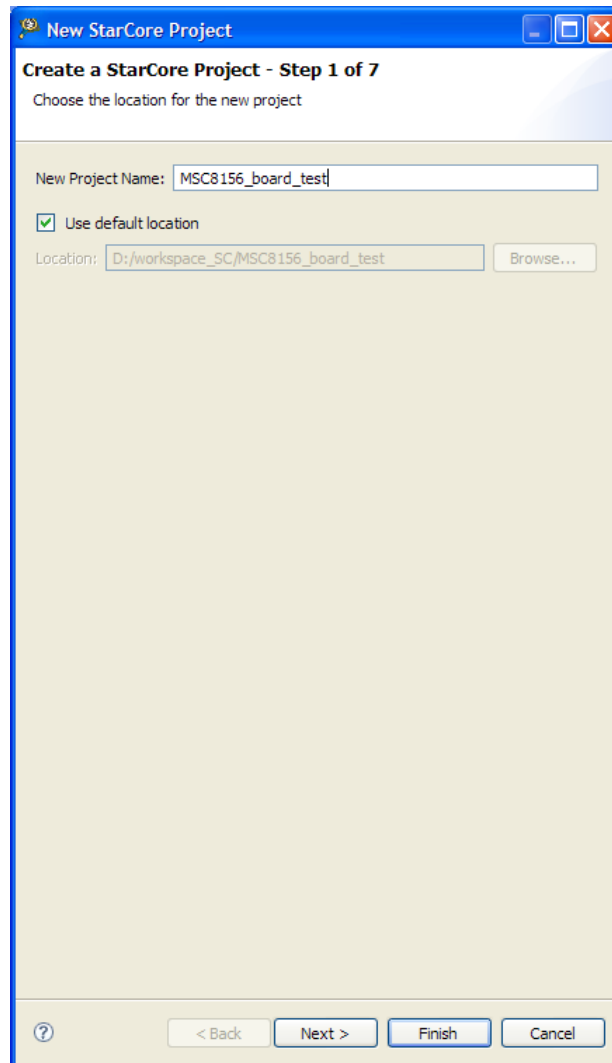


Figure 1. Specifying the Project's Name

The **Devices** page appears (see [Figure 2](#)).

3. Open the tree control for the desired StarCore part, which for the MSC8156EVM board is MSC815x Family. Select the desired processor by clicking on the correct processor in the list (MSC8156 for this example). Leave the **Project Type** option set for Application. Click **Next**.

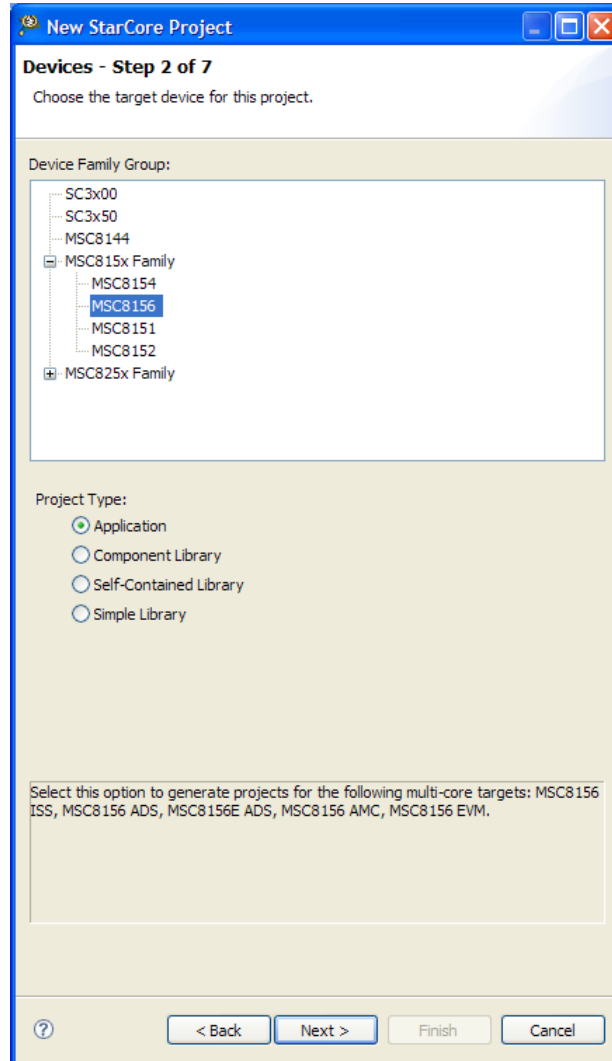


Figure 2. Choosing the Appropriate StarCore Processor

The **Build Settings** page appears (see [Figure 3](#)).

4. Choose the memory model that the application uses and the programming language used to write the application. For this example, the default settings were used. Click **Next**.

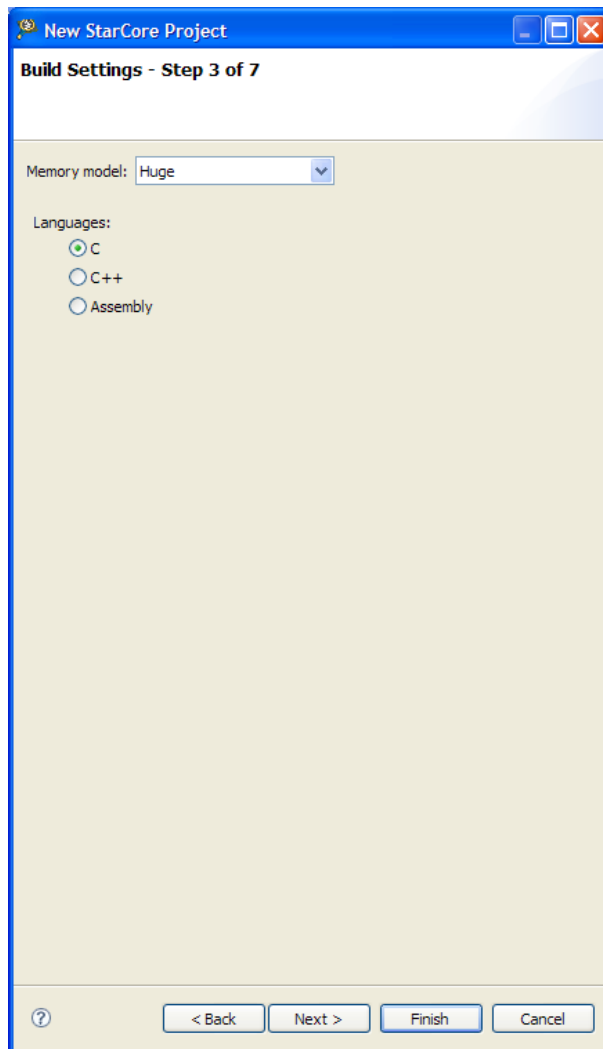


Figure 3. Choosing the Memory Model and Language

The **SmartDSP OS** page appears (see [Figure 4](#)).

5. This page allows the choice of integrating Freescale's SmartDSP OS, a real-time operating system, with the application. Choose whether to add the OS or not by clicking on the appropriate option and then click **Next**.

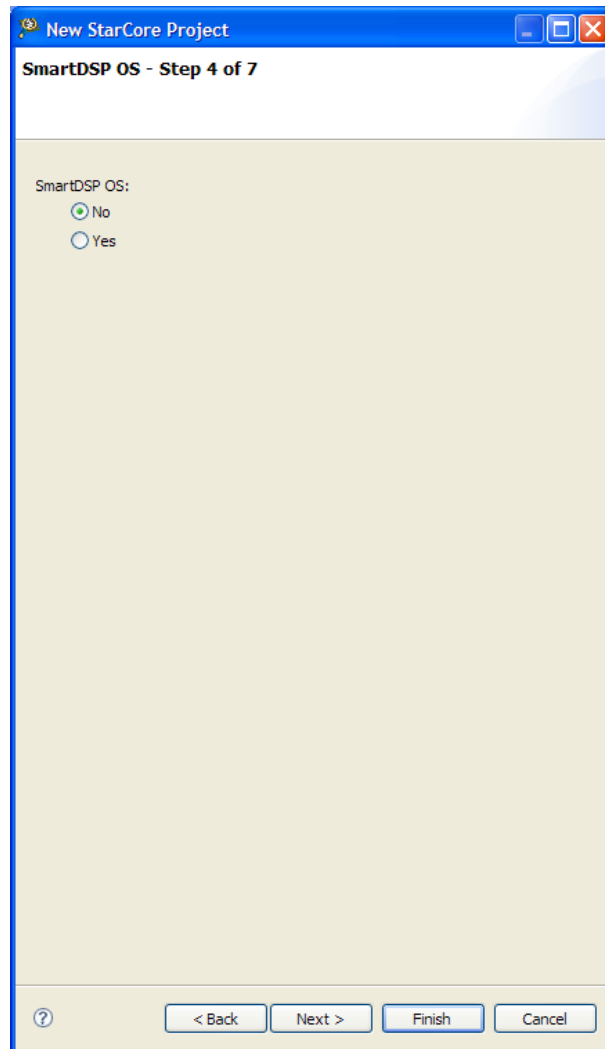


Figure 4. Specifying the Use of a DSP OS

The **Launch Configurations** page appears (see [Figure 5](#)).

6. This page specifies the execution target (such as hardware or simulator) and other launch configuration options. Make any desired changes to the default options and click **Next**.

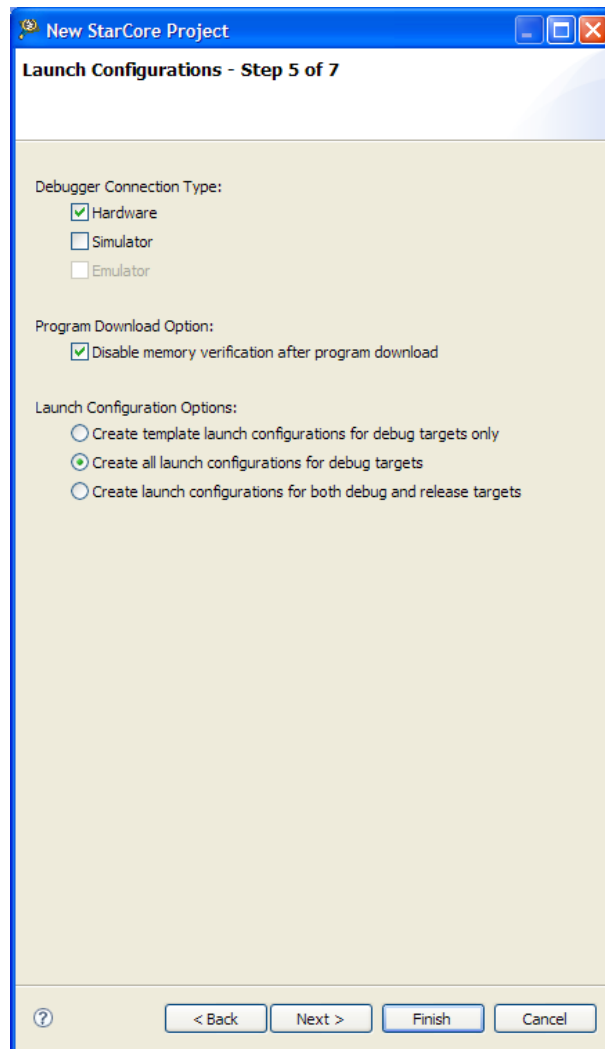


Figure 5. Selecting the Execution Target and Launch Configuration Settings

The **Hardware** page appears (see [Figure 6](#)).

7. The default board for the given processor choice is the MSC8156ADS, and the target processor is the MSC8156/E. Note that most of the other choices are disabled. Click on the MSC8156EVM option to select it. Make any desired changes to the **Connection Type** option and click **Next**.

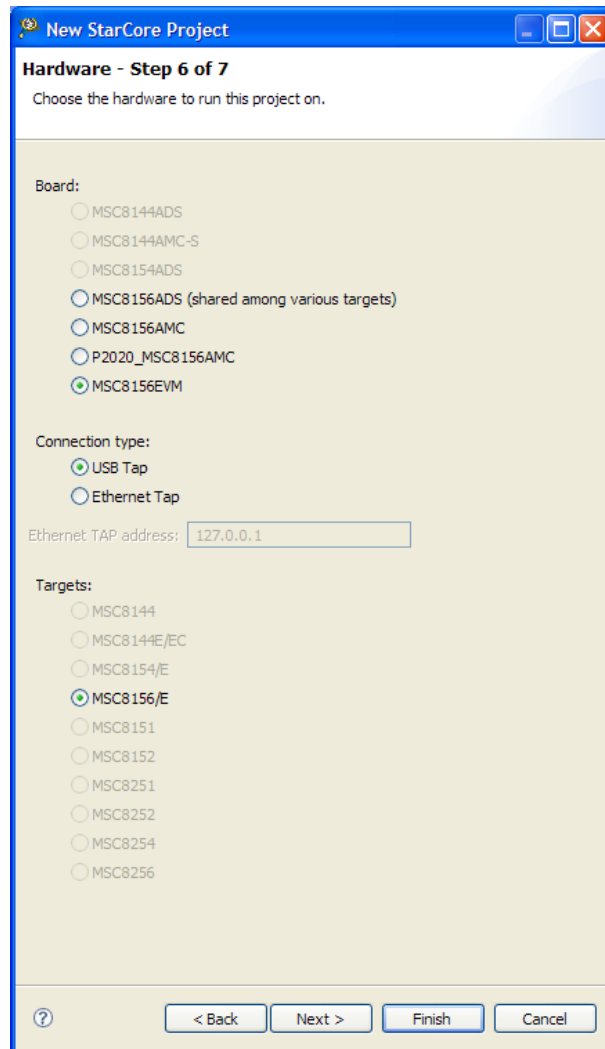


Figure 6. Choosing the Appropriate Options for the MSC8156EVM

The **Software Analysis Trace and Profile** page appears (see [Figure 7](#)).

8. Check **Enable trace and profile** if performance statistics are required. Otherwise, leave this option unchecked. Click **Finish**.

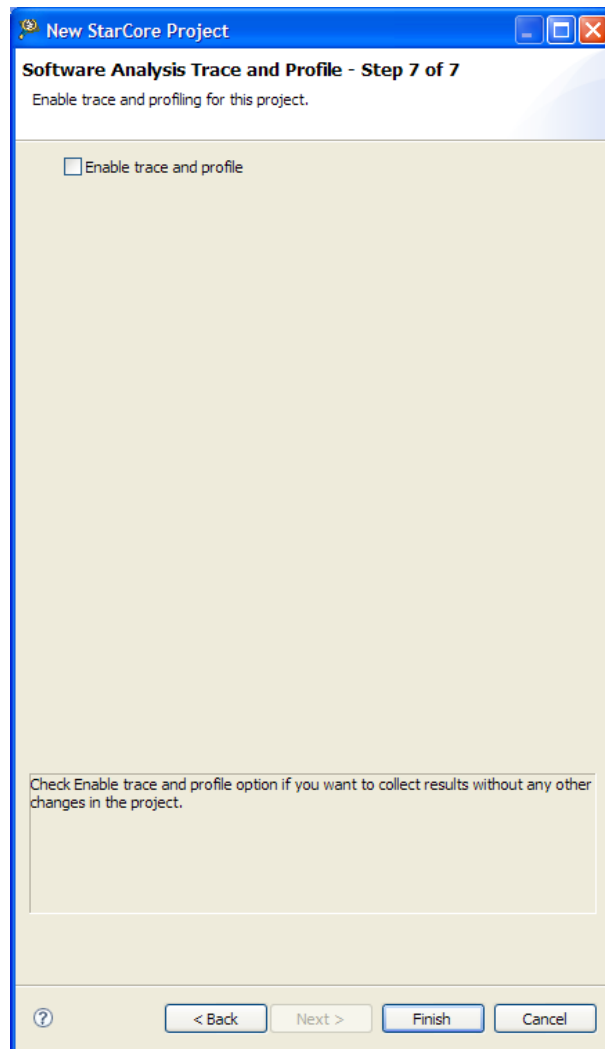


Figure 7. Enabling Trace Analysis Functions

The CodeWarrior StarCore Project wizard generates an application template in the specified folder and in the C/C++ Perspective, the project appears in the **CodeWarrior Projects** view (see [Figure 8](#)). Note that the name of the project folder in this view is a combination of the names of the project (MSC8156_board_test), the programming language (C), the execution mode (Debug), and the target (8156_HW).

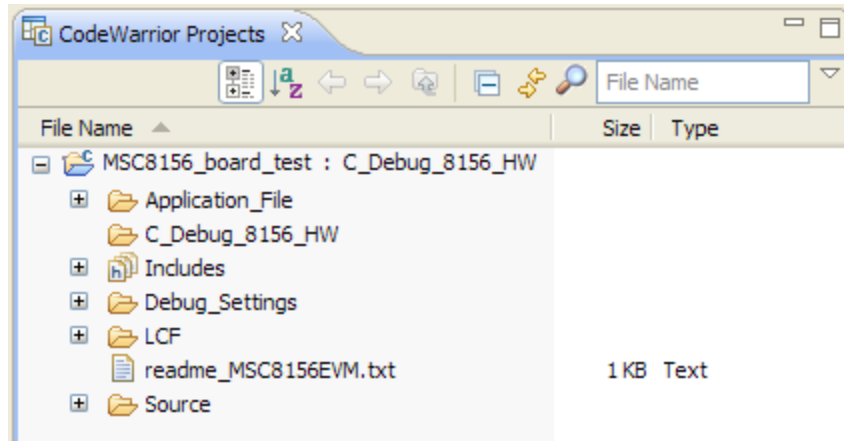


Figure 8. The Completed CodeWarrior Project

2 Examine the Project

Examine the project to see what the wizard generated. Specifically, study the project's launch configurations for their purpose and to check whether further modifications to the project's settings are needed.

A CodeWarrior project consists of one or more launch configurations. A *launch configuration* describes the settings and conditions under which an application launches and executes. For example, the launch configuration specifies whether the application is under debug control or not, the type of interface that connects the workstation running the CodeWarrior tools to the board, and, for multiple core processors, which core executes the application code.

To display the launch configurations generated by the wizard, choose **Run > Debug Configurations**.

The **Debug Configurations** dialog appears (see Figure 9).

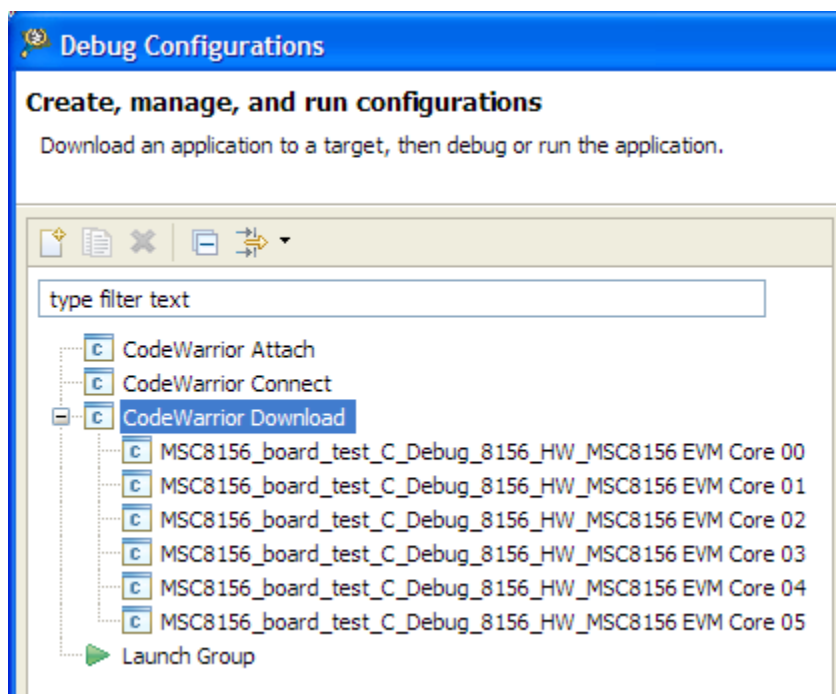


Figure 9. The Launch Configurations Generated for the Project

The six entries under the **CodeWarrior Download** item are the launch configurations generated by the wizard. As their names indicate, each launch configuration is assigned to specific core. For example, the launch configuration `MSC8156_board_test_C_Debug_8156_HW_MSC8156 EVM Core 0` configures and controls core 0 in the processor.

When one of the launch configurations is clicked on, the view on the right side of the **Debug Configurations** window displays the configuration's settings. Clicking on the **Debugger** tab in this window displays the settings used during a debugging session (see Figure 10).

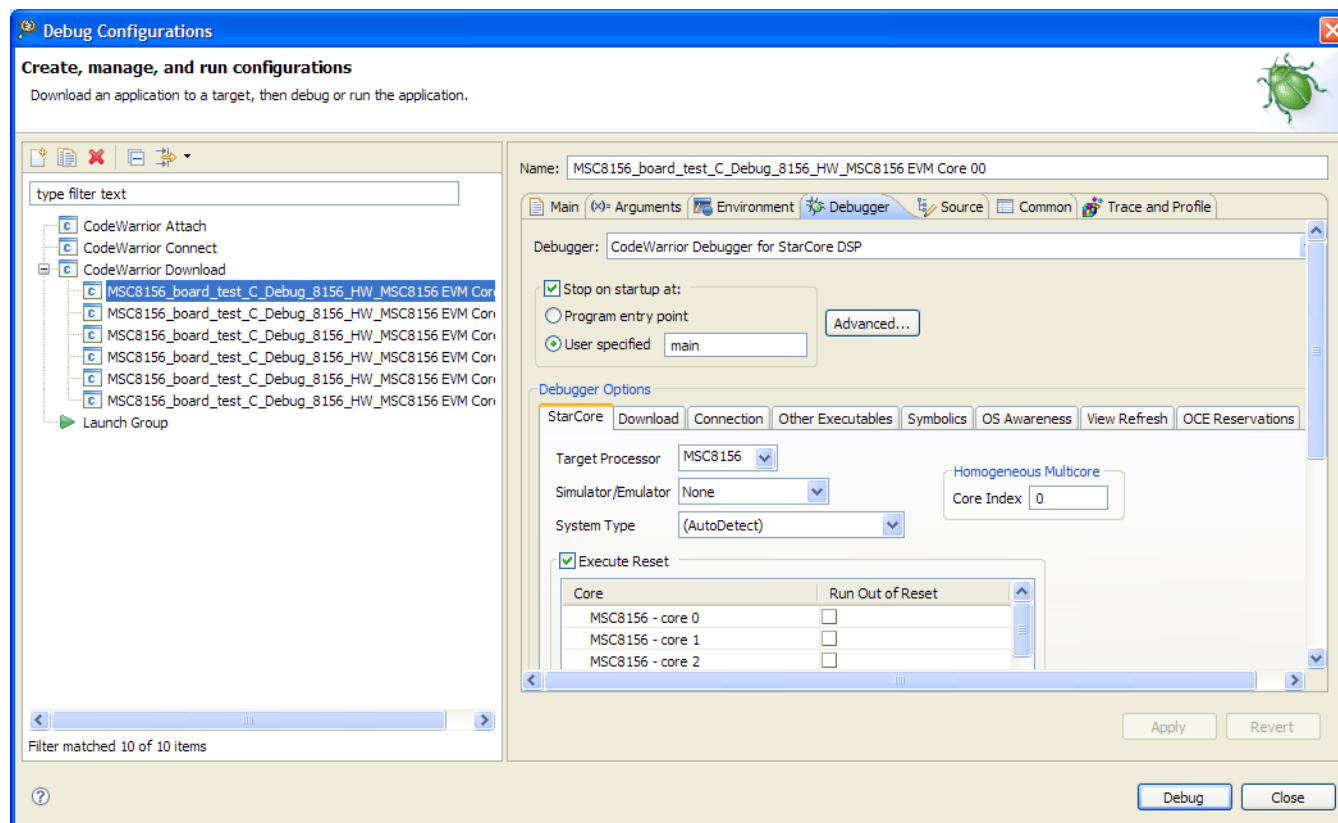


Figure 10. View on the Right Displays the Settings for the Selected Configuration

The various tabs visible under the **Debugger** tab are used to display and modify the configuration's settings for a debug session. For example, if the hardware connection between the workstation and the target board were to change, the options displayed by the **Connection** tab would be used to adjust the configuration's settings to match those of the new interface. In general, the settings for each configuration should be identical, with the exception of the **Core Index** value displayed by the **StarCore** tab.

NOTE

The configuration managing core 0 can also specify whether to reset the core or use special initialization files. For more information on these options, consult application note AN4145, "Debugging Multicore StarCore DSP Applications with Eclipse."

Complete details on all of the debugger options and their settings can be found in the *CodeWarrior Development Studio for StarCore DSP Architecture Targeting Manual*.

3 Set Up a Launch Group

The project should include a launch group to best use the MSC8156EVM's StarCore processor's multiple cores. A *launch group* is a logical container in the CodeWarrior debugger that organizes and manages multiple launch configurations. Recall that each launch configuration is associated with a specific core, so a launch group can put together six launch configurations that control all six of the StarCore processor's cores. Launch groups can also be created that manage a subset of the processor cores or other launch groups.

To add a launch group to the project, proceed as follows:

1. In the **Debug Configurations** dialog, select the **Launch Group** control in the view at the left. Click on the **New** icon.
A view for configuring the launch group appears at the right.
2. Type in the name of the launch group into the **Name** option (in this example, MSC8156_board_test_group). Click **Apply**.
3. A new item appears under the **Launch Group** control, named MSC8156_board_test_group (see [Figure 11](#)).

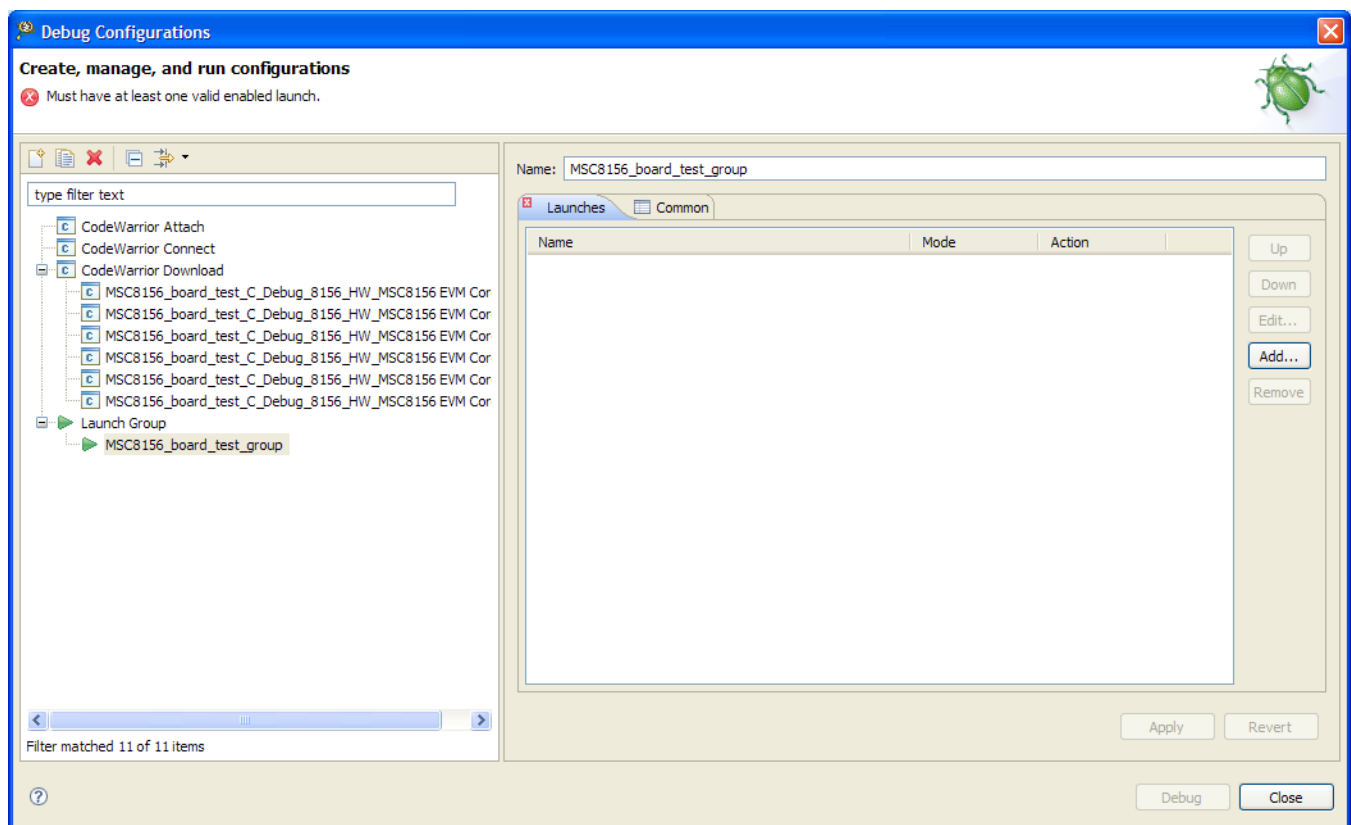


Figure 11. Naming the Launch Group

4. Once the launch group has been created, the appropriate launch configurations need to be added to it. Click **Add**.

An **Add Launch Configuration** dialog appears (see [Figure 12](#)).

5. Expand the **CodeWarrior Download** control. Click on the launch configuration `MSC8156_board_test_C_Debug_8156_HW_MSC8156 EVM Core 0`. Shift-click on the launch configuration `MSC8156_board_test_C_Debug_8156_HW_MSC8156 EVM Core 5` to select the other five launch configurations. Click **OK**.

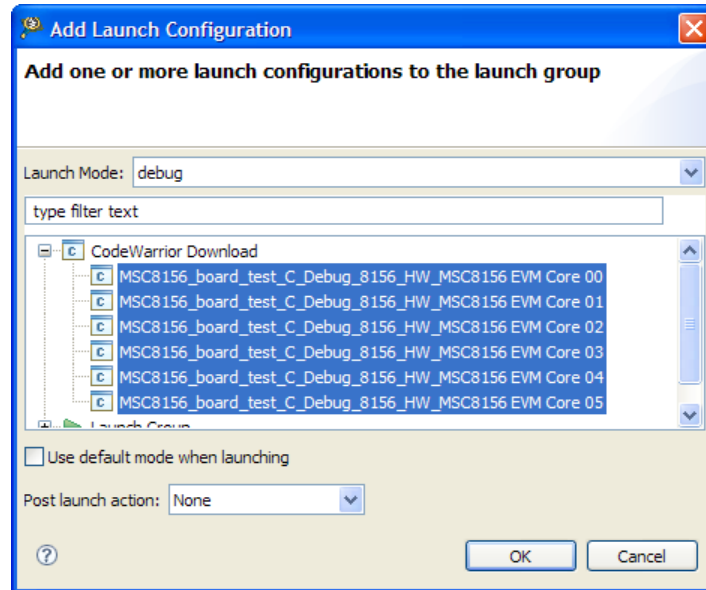


Figure 12. Assigning All Six of the Launch Configurations to the Launch Group

NOTE

For more information on the other options in this dialog, consult the application note AN4145, “Debugging Multicore StarCore DSP Applications with Eclipse.”

The chosen launch configurations appear in the launch group view (see Figure 13).

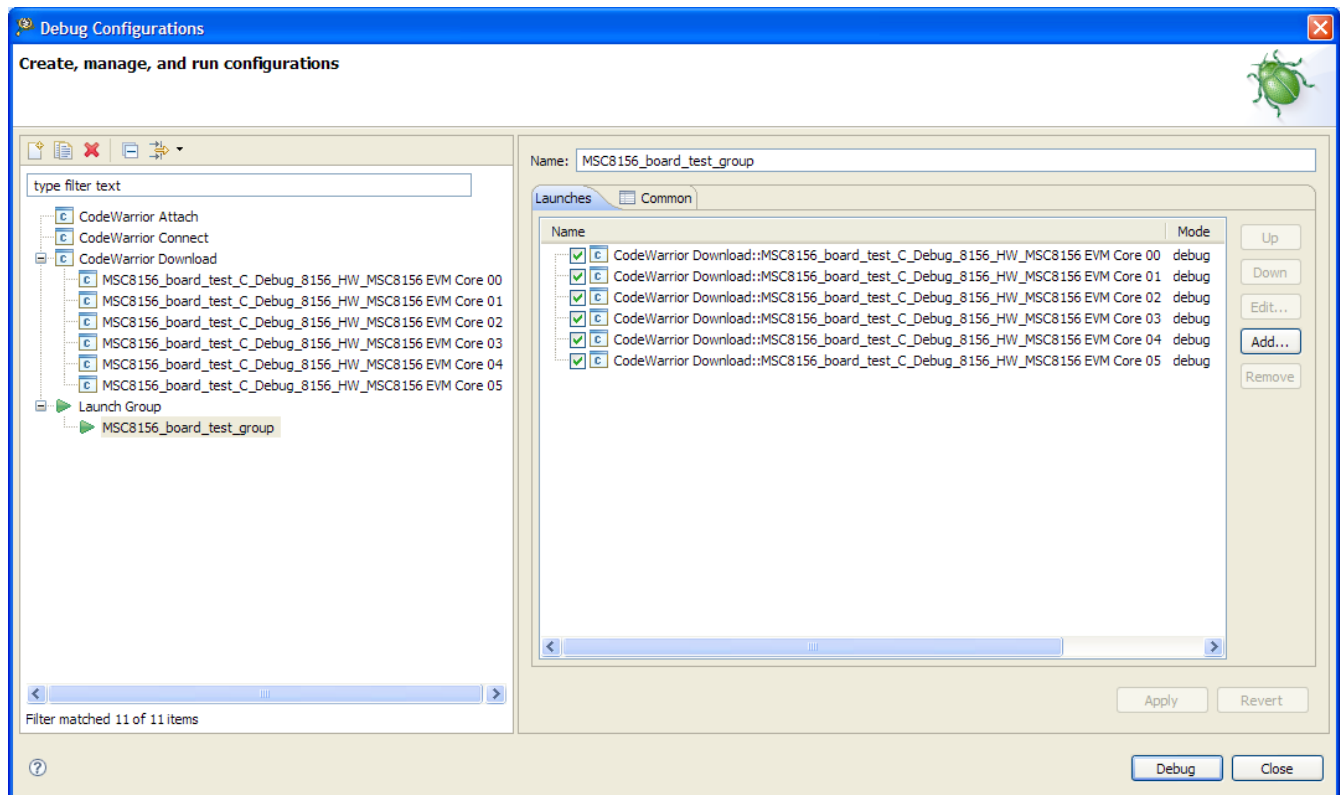


Figure 13. The Launch Group and Its Assigned Launch Configurations

6. Click **Apply** to save the changes.

4 Using the Launch Group

To use the launch group, either click on **Debug** in the **Debug Configurations** dialog or choose `MSC8156_board_test_group` from the Debug menu icon. The Debug Perspective appears, and all six launch configurations load and launch in the Debug view.

When using the default DSP application code and settings generated by the wizard, after all six processor cores start and initialize, they halt on the `main()` function in the editor view, as Figure 14 shows.

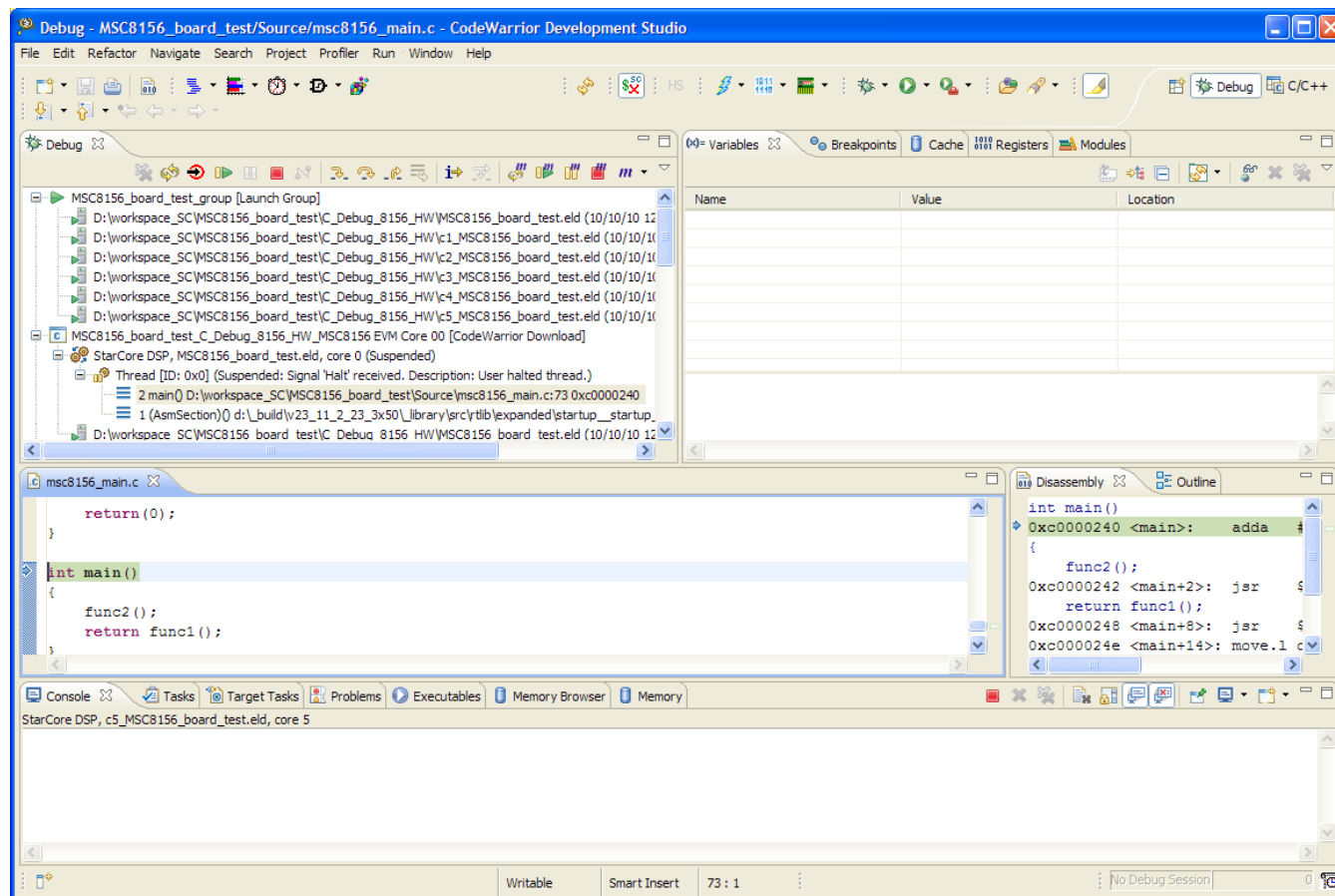


Figure 14. The CodeWarrior Debugger After the Launch Group Starts

5 Revision History

Table 1 provides a revision history for this application note.

Table 1. Revision History

Rev. Number	Date	Substantive Change
A	10/10/10	Initial NDA release

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