

Using CodeWarrior for Assembler and C Programming

These instructions will guide through the steps to create:

1. Assembler programs in Code warrior
2. C programs in Code Warrior
- or
3. Assembler and C programs in Code warrior

Follow these instructions carefully

Part 1: Creating a Project in Code Warrior

1. Start CodeWarrior. Select **Create new project**. Select the correct derivative of the HCS Microcontroller by clicking on **HCS12**, click on **HCS12D Family** and then click on the **HC9S12DP256B**. For **Connections** be sure that **Full Chip Simulation** is highlighted. Click on Next.

In **Project Parameters** select one of the choices below:

- **Absolute Assembler** – for an Assembler program
 - **C** - for a C program
 - **C and Relocatable Assembler** - for Assembler and C programs
2. Under **Location** specify a path and a **Project Name** for your files. Click on Next.
 3. On the **Add Additional Files** page, unclick **Copy files to project**. Click on Next.
 4. Be sure **None** is selected on the **Processor Expert** page. Click on Next.
 5. If you are creating a C file, then on the **C/C++ Options** page menu, select **ANSI startup code**, **Small memory model** and **None** for the floating point format. Click on Next. If you are creating an Assembly program this page will be skipped.
 6. Select **None** for **PC_Lint**. Click on **Finish**. CodeWarrior will now create your project.

Part 2: Configuring Code Warrior

1. On the CodeWarrior main menu, select **Edit - Standard Settings**, select **Target - Compiler for HC12**, then click on **Options**. Click on the **Output** tab, and select the **Generate Listing File** option. Click on OK. Repeat as follows - select **Edit - Standard Settings**, select **Target - Assembler for HC12**, then click on **Options**. Click on the **Output** tab, and select the **Generate Listing File** option. Click on OK.

2. Now click on **Burner for HC12**, then click on **Options**. Select and open the **Configure S-Records** option and unclick the **No S9-record** option. Click on OK. Click on OK again to exit **Standard Settings**.
3. For C and C and Assembler files, CodeWarrior uses a linker file called Project.prm that tells the compiler where to put the program and data. In the window which lists the project files, select **Project Settings - Linker Files -Project.prm**

Find the following line in this file

```
RAM = READ_WRITE 0x1000 TO 0x3FFF ;
```

change it to

```
RAM = READ_WRITE 0x1000 TO 0x1FFF ;
```

```
PROG = READ_ONLY 0x2000 TO 0x3C00 ;
```

Next, find the line

```
INTO ROM_C000/* , ROM_4000 */ ;
```

change it to

```
INTO PROG/* , ROM_4000 */ ;
```

Now find the line

```
VECTOR 0 _Startup /* reset vector: this is the default entry point for a C/C++ application. */
```

comment out this line using `//`.

Close and Save **the Project.prm** file.

Part 3: Writing your Programs

Depending on whether you are writing an Assembler program, a C program or a C and Assembler program do the following as required:

- Click on **main.c** to open it, highlight and delete the contents of the file and then copy your C code for your program into this file while keeping the required parts of the file as appropriate (included files for example). See your instructor for details.
- Click on **main.asm** to open it, highlight and delete the contents of the file and then copy your Assembler code for your program into this file while keeping the required parts of the file as appropriate. If you are using **Absolute Assembler** then use an `org` statement in your code. If you are using **Relocatable Assembler** do not use an `org` statement in your code. See your instructor for details.

Part 4: Compiling/Assembling your files in Code warrior

1. On the CodeWarrior main menu, select **Project - Make**. The code will be compiled and any syntax errors will be displayed. Correct them and compile again if needed.
2. For C and C and Assembler files, CodeWarrior generates a file **Project.map** in the Project files window. The file **Project.map** shows the addresses of the C functions and of any global variables. The **Project.map** file also shows the program entry point in the **STARTUP SECTION**. You can determine the program entry point address for your code. This is required to be able to execute your code – see Part 5.
3. The listing file will be called main.lst in the bin subdirectory of the CodeWarrior project. The listing file includes the C statements as well as the assembly language which was generated. The listing (.lst) file is found in the .bin directory of your project directory.

Part 5: Downloading and Executing your files in AsmIDE

4. Once your files have been successfully compiled/assembled and an .s19 file has been generated, open AsmIDE and download and run your program as you have previously done. The .s19 file is found in the .bin directory of your project directory. The source code files are found in the Sources subdirectory.

For Assembler only files, execute the program by typing `g 2000` assuming that you used an org \$2000 in your code.

For C and C and Assembler files type `g <entry point address>` - where the entry point address is found in Part 4 above

Part 6: Downloading CodeWarrior

You can find a link on the course web site to download CodeWarrior. Or you can go directly to:

http://www.freescale.com/webapp/sps/site/overview.jsp?code=CW_SPECIAL EDITIONS&tid=CWH

Choose the fifth link offered Special Edition: CodeWarrior for HCS12(X) Microcontrollers (Classic) ver 5.1

If you are installing CodeWarrior with Windows 7 as an operating system, you will need to make the following change.

Right click on the shortcut icon for CodeWarrior. Click on **Properties** and select the **Compatibility tab**. Click on **Disable desktop composition** and then click on Ok.