

## INTEGRATING RAISONANCE 8051 TOOLS INTO THE SILICON LABS IDE

### 1. Introduction

This application note describes how to integrate the Raisonance 8051 Tools into the Silicon Laboratories IDE (Integrated Development Environment). Integration provides an efficient development environment with compose, edit, build, download and debug operations integrated in the same program.

### 2. Key Points

- The Intel OMF-51 absolute object file generated by the Raisonance 8051 tools enables source-level debug from the Silicon Labs IDE.
- Once Raisonance Tools are integrated into the IDE they are called by simply pressing the 'Assemble/Compile Current File' button or the 'Build/Make Project' button.
- See the “..\Silabs\MCU\Examples” directory for examples that can be used with the Raisonance tools.
- Information in this application note applies to Version 4.00 and later of the Silicon Labs IDE and Ride7 and later of the Raisonance 8051 tools.

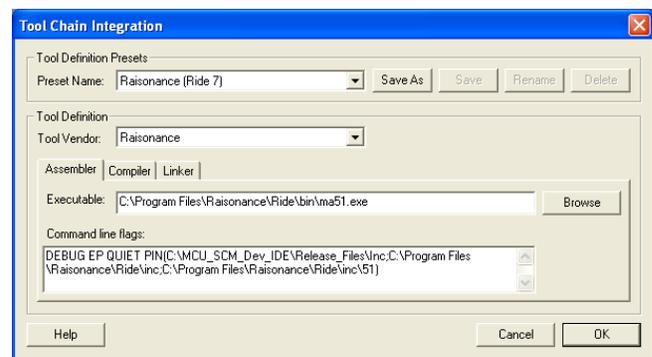
### 3. Create a Project in the Silicon Labs IDE

A project is necessary in order to link assembly files created by the compiler and build an absolute 'OMF-51' output file. Follow these steps to create a project:

1. Under the 'Project' menu, select 'Add Files to Project...'. Select the 'C' source files that you want to add and click 'Open'. Continue adding files until all project files have been added.
2. To add files to the build process, right-click on the file name in the 'Project Window' and select 'Add filename to build'.
3. Under the 'Project' menu, select 'Save Project As...'. Enter a project workspace name and click 'Save'.

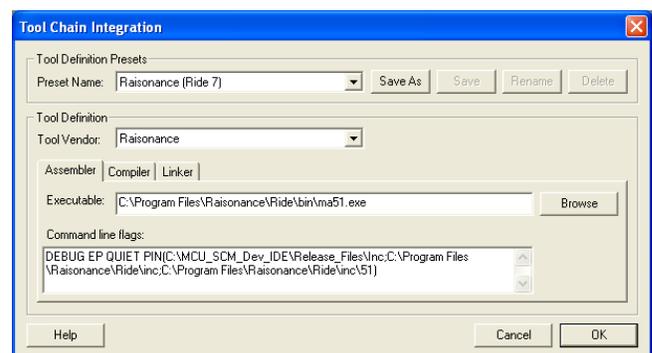
### 4. Configure the Tool Chain Integration Dialog

Under the 'Project' menu, select 'Tool Chain Integration' to bring up the dialog box shown below. Raisonance (Ride 7) is the default. To use Raisonance (Ride 6), you can select it from the 'Preset Name' drop down box under 'Tools Definition Presets'. Next, define the Raisonance assembler, compiler, and linker as shown in the following sections.



#### 4.1. Assembler Definition

1. Under the 'Assembler' tab, if the assembler executable is not already defined, click the browse button next to the 'Executable:' text box, and locate the assembler executable. The default location for the Raisonance assembler is:  
C:\Program Files\Raisonance\Ride7\bin\ma51.exe
2. Enter any additional command line flags directly in the 'Command Line Flags' box.
3. See the following figure for the 'Assembler' tab with the default Raisonance settings.



## 4.2. Compiler Definition

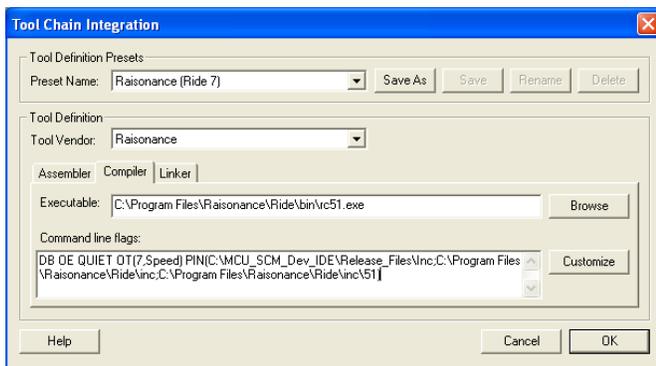
- Under the 'Compiler' tab, if the compiler executable is not already defined, click the browse button next to the 'Executable:' text box, and locate the compiler executable. The default location for the Raisonance compiler is:

C:\Program Files\Raisonance\Ride7\bin\ma51.exe

- Enter any additional command line flags directly in the 'Command Line Flags' box.

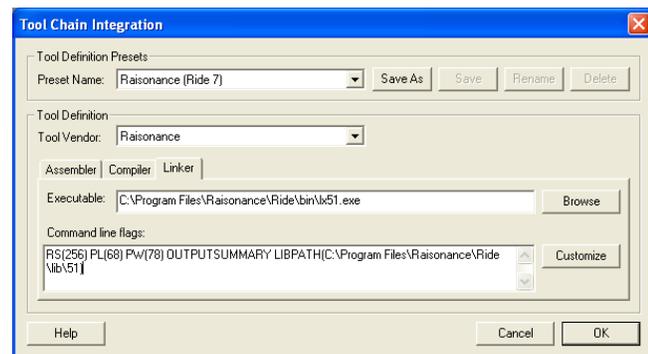
**Note:** Add the FP(IEEE,FP251) flag if any floating point variables are being viewed in the Watch Window.

- See the following figure for the 'Compiler' tab with the default Raisonance settings.



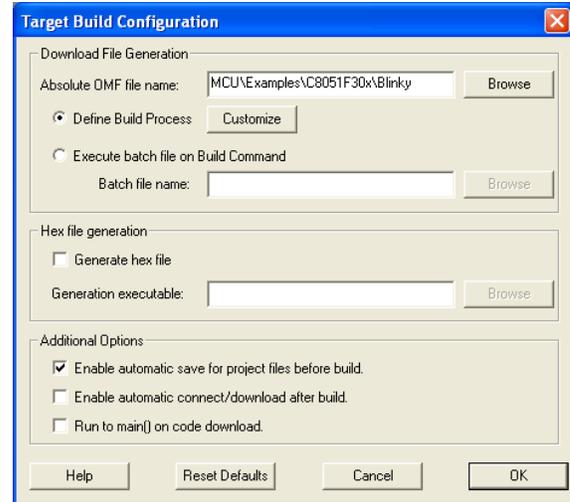
## 4.3. Linker Definition

- Under the 'Linker' tab, if the linker executable is not already defined, click the browse button next to the 'Executable:' text box, and locate the linker executable. The default location for the Raisonance linker is:
- C:\Program Files\Raisonance\Ride\bin\lx51.exe
- Enter any additional command line flags directly in the 'Command line flags' box.
  - See the following figure for the 'Linker' tab with the default Raisonance settings.



## 5. Target Build Configuration

Under the 'Project' menu select 'Target Build Configuration' to bring up the dialog box shown below.

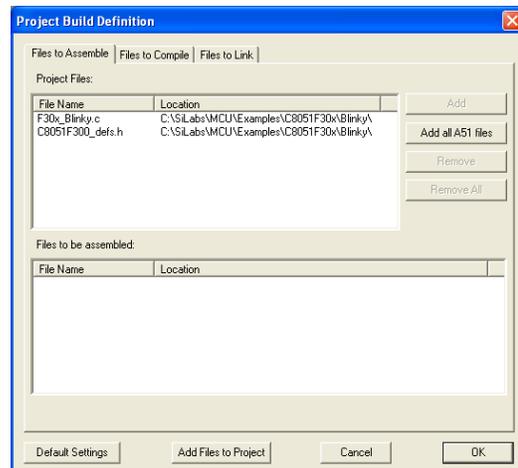


### 5.1. Output Filename

To customize a default filename or to create a new filename, click the browse button next to the 'Absolute OMF file name:' edit box. Select a path and enter an output filename with no extension (ex. blinky.).

### 5.2. Project Build Definition

Click the 'Customize' button to bring up the 'Project Build Definition' window shown below. This window allows selection of the files to be included in the build process. Although, default assemble and compile selections will be made, ensure that all files have been correctly included in the build process. Under each tab, add Files to assemble or compile by selecting the desired file and clicking the 'Add' button. Files are removed in the same manner.



### 5.3. Additional Options

1. If the 'Enable automatic save for project files before build.' box is checked, then all files included in the project will be automatically saved when the 'Build/Make project' button is pressed.
2. If the 'Enable automatic connect/download after build.' box is checked, then the project will be automatically downloaded to the target board when the 'Build/Make project' button is pressed.
3. If the "Run to main() on code download." box is checked, the target board will halt at the first line in main() when the "Download code" button is pressed.

## 6. Building the Project

1. After saving all files that have been edited, the previous revisions will be saved in backup files. Backups are saved as the name of the file with the extension #1, #2, #3, and so on up to the number of backups (N) created and available. '#1' being the most recent and 'N' being the least recent.
2. Click the 'Assemble/Compile current file' button to compile just the current file.
3. Click the 'Build/Make project' button to compile and link all the files in the project.
4. Review the errors and warnings generated during the build process located in the 'Build' tab of the Output window (typically found at the bottom of the screen). Carefully viewing the entire length of the build report is recommended, due to the fact that the Raisonance linker will continue to link even when there are compiler errors. Double-clicking on an error that is associated with a line number will automatically move the cursor to the proper line number in the source file that generated the error.

## 7. Source/Include File Examples

Example source files and include files for each of the Silicon Labs devices are included with the Silicon Labs IDE installation. These examples can be used with the Raisonance tools without making any changes. The default location for these examples is "C:\Silabs\MCU\Examples". In addition, examples can be found in many Silicon Labs Application Notes.

## 8. Troubleshooting

For troubleshooting guidelines, see MCU Knowledge Base article #311264:

<http://cp-siliconlabs.kb.net/article.aspx?article=311264&p=4120>

## DOCUMENT CHANGE LIST

### Revision 1.2 to Revision 1.3

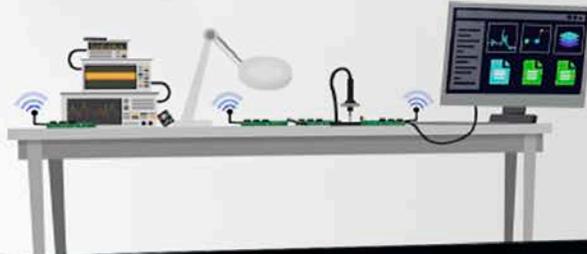
- Introduction updated.
- Example path updated from C:\Cygna\Examples to C:\Silabs\MCU\Examples.
- Target Build Configuration and Project Build Definition windows screenshots updated to reflect the new examples path.
- Tool Chain Integration windows screenshots updated for new Raisonance settings.
- Key Points updated to include Silicon Labs and Raisonance tools version information.

### Revision 1.3 to Revision 1.4

- Tool Chain Integration windows screenshots updated for new Raisonance settings.
- Key Points updated to include Silicon Labs and Raisonance tools version information.
- Paths updated to reflect new Raisonance installation paths.

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