PAC55XX CPU Support Package Guide

Version: 4.0

Contents

PAC55XX Support Package

This guide describes the following features of the PAC55XX CPU support package:

- How to create PAC55XX projects
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- PAC55XX specific project templates
- Supported PAC55XX devices

Creating PAC55XX Projects

Creating an PAC55XX C/C++ executable project

To create a new minimal C/C++ executable project:

Select the **File** > **New** > **New Project** menu item.
Select the **A C/C++ executable for Active-Semi PAC55XX** project template.
Set the required project name and location directory.
Click **Next**.
If required, change any of the default project settings.
Click **Finish** to create the project.

Creating an PAC55XX library project

To create a new library project:

Select the **File** > **New** > **New Project** menu item.
Select the **A library for Active-Semi PAC55XX** project template.
Set the required project name and location directory.
Click **Next**.
If required, change any of the default project settings.
Click **Finish** to create the project.

Creating an PAC55XX externally built executable project

To create a new project that will allow you to debug an existing externally built executable file:

Select the **File** > **New** > **New Project** menu item.
Select the **An externally built executable for Active-Semi PAC55XX** project template.
Set the required project name and location directory.
Click **Next**.
Set the **Load File** project property to point to the executable file you want to download and debug.
If required, change any of the other default project settings.
Click **Finish** to create the project.

Creating an PAC55XX CrossWorks Tasking Library executable project

To create a new C/C++ executable project configured to use the CrossWorks Tasking Library:

Select the **File** > **New** > **New Project** menu item.
Select the **A CrossWorks Tasking Library executable for Active-Semi PAC55XX** project template.
Set the required project name and location directory.
Click **Next**.

If required, change any of the other default project settings.
Click **Finish** to create the project.

Creating an PAC55XX assembly code only executable project

Please note, this template does not add any C/C++ startup code or libraries and is therefore not suitable for creating projects that include C/C++ code.

To create a new assembly code only executable project without:

Select the **File** > **New** > **New Project** menu item.
Select the **An assembly code only executable for Active-Semi PAC55XX** project template.
Set the required project name and location directory.
Click **Next**.
If required, change any of the other default project settings.
Click **Finish** to create the project.

Opening PAC55XX Sample Solutions

PAC55XX Samples Solution

This solution contains general sample projects that run on PAC55XX devices. To open the PAC55XX Samples Solution:

Select the **Tools** > **Show Installed Packages** menu item.
Select the **Active-Semi PAC55XX CPU Support Package** link.
Select the **Samples Solutions** > **PAC55XX Samples Solution** link.

PAC55XX CMSIS-DSP Samples Solution

This solution contains sample projects that use the CMSIS-DSP library running on PAC55XX devices. To open the PAC55XX CMSIS-DSP Samples Solution:

Select the **Tools** > **Show Installed Packages** menu item.
Select the **Active-Semi PAC55XX CPU Support Package** link.
Select the **Sample Solutions** > **PAC55XX CMSIS-DSP Samples Solution** link.

PAC55XX Project Properties

Projects creating using the project templates in this support package have the following device specific project properties:

Heap Size

The heap size is set to be 256 bytes when a project is created. The heap size can be modified using the **Heap Size** project property.

Section Placement

You can select the memory configuration you require using the **Section Placement** project property.

For PAC55XX projects, the set of placements are:

Flash - The application runs in internal Flash memory *(default)*.
Flash Vectors In RAM - The application runs in internal Flash memory and exception vectors are copied to RAM memory.
Flash Copy To RAM - The application starts in internal flash and copies itself to run from internal RAM memory.
RAM - The application runs from internal RAM memory only.

Stack Sizes

The main stack size is set to be 256 bytes when a project is created.

The process stack size is set to be 0 bytes when a project is created.

The main and process stack sizes can be modified using the **Main Stack Size** and **Process Stack Size** project properties.

To change the location of the stacks, edit the section placement file and place the *.stack* and *.stack_process* sections as required.

Startup From Reset

By default, the application will only startup from power-on/reset in *Release* configuration. This acts as a safety net in case you accidently download a program in FLASH during development that crashes and prevents the debugger from taking control of the target over the debug interface thus rendering the device unusable.

For PAC55XX projects, the **Startup From Reset** project property can be set to one of the following:

No - The application will not startup from reset.

Release Only - The application will only startup from reset when built in *Release* configuration *(default)*.
Yes - The application will always startup from reset.

Target Processor

Once a project has been created you can target different devices by modifying the **Target Processor** project property. See the **PAC55XX Devices** section for details on the files, preprocessor definitions and macro definitions used when a device is selected.

PAC55XX Project Templates

The project template system simplifies the creation of new projects with the IDE, it also system makes it easy to create new projects with a text editor or script. All that needs to be specified is the project name, the support packages that the project is dependent on, the target processor and the source files you want to add to the project. For example, create a file called *example.hzp* with the following contents:

```
<!DOCTYPE CrossStudio_Project_File>
<solution Name="Example Solution">
  <project Name="Example Project" template_name="PAC55XX_EXE">
    <configuration Name="Common" package_dependencies="PAC55XX" Target="PAC5523" />
    <folder Name="Source Files">
      <file file_name="file1.c" />
      <file file_name="file2.c" />
    </folder>
  </project>
</solution>
```

You can also add any other property settings that the project requires such as preprocessor definitions or include paths using the property save name, for example:

```
<!DOCTYPE CrossStudio_Project_File>
<solution Name="Example Solution">
  <project Name="Example Project" template_name="PAC55XX_EXE">
    <configuration Name="Common" package_dependencies="PAC55XX" Target="PAC5523"
 c_preprocessor_definitions="MYDEF1=1;MYDEF2=TWO" c_user_include_directories="$(ProjectDir)/
include1;$(ProjectDir)/include2" />
    <folder Name="Source Files">
      <file file_name="file1.c" />
      <file file_name="file2.c" />
    </folder>
  </project>
</solution>
```

Available PAC55XX project templates

Template Name	Template Description
PAC55XX_ASM_EXE	PAC55XX Assembly Code Only Executable
PAC55XX_CTL_EXE	PAC55XX CTL Executable
PAC55XX_EXE	PAC55XX C/C++ Executable
PAC55XX_EXT_EXE	PAC55XX Externally Built Executable
PAC55XX_LIB	PAC55XX Library

PAC55XX Devices

This package supports the following PAC55XX devices:

- **PAC55XX Family**

PAC55XX Family

PAC5523

PAC5523

Device Details	
CMSIS Header File	$(TargetsDir)/PAC55XX/CMSIS/Device/Include/PAC55XX_device.h
CMSIS Include Path	$(TargetsDir)/PAC55XX/CMSIS/Device/Include
CMSIS System File	$(TargetsDir)/PAC55XX/CMSIS/Device/Source/system_pac55xx.c
Family	PAC55XX
Sub Family	PAC55XX
Loader File	$(TargetsDir)/PAC55XX/Loader/PAC55XX_Loader.elf
Memory Map File	$(TargetsDir)/PAC55XX/XML/PAC5523_MemoryMap.xml
Register Definition File	$(TargetsDir)/PAC55XX/XML/PAC55XX_Registers.xml
Vectors File	$(TargetsDir)/PAC55XX/Source/PAC55XX_Vectors.s

Preprocessor Definitions
ARM_MATH_CM4
__PAC5523__
__PAC55XX_FAMILY
__PAC55XX_SUBFAMILY

Memory Segments	
FLASH	0x00000000 - 0x0001FFFF
RAM	0x20000000 - 0x20007FFF

Project Macros
DeviceIncludePath=$(TargetsDir)/PAC55XX/CMSIS/Device/Include
DeviceHeaderFile=$(TargetsDir)/PAC55XX/CMSIS/Device/Include/PAC55XX_device.h
DeviceLoaderFile=$(TargetsDir)/PAC55XX/Loader/PAC55XX_Loader.elf
DeviceRegisterDefinitionFile=$(TargetsDir)/PAC55XX/XML/PAC55XX_Registers.xml
DeviceSystemFile=$(TargetsDir)/PAC55XX/CMSIS/Device/Source/system_pac55xx.c
DeviceVectorsFile=$(TargetsDir)/PAC55XX/Source/PAC55XX_Vectors.s
DeviceFamily=PAC55XX
DeviceSubFamily=PAC55XX