ADuCM320 CPU Support Package Guide

Version: 3.1

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ADuCM320 Support Package

This guide describes the following features of the ADuCM320 CPU support package:

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Creating ADuCM320 Projects

Creating an ADuCM320 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 Analog Devices ADuCM320** 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 ADuCM320 library project

To create a new library project:

- Select the **File** > **New** > **New Project** menu item.
- Select the **A library for Analog Devices ADuCM320** 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 ADuCM320 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 Analog Devices ADuCM320** 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 ADuCM320 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 Analog Devices ADuCM320** 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 ADuCM320 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 Analog Devices ADuCM320** 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 ADuCM320 Sample Solutions

ADuCM320 Samples Solution

This solution contains general sample projects that run on ADuCM320 devices. To open the ADuCM320 Samples Solution:

- Select the **Tools** > **Show Installed Packages** menu item.
- Select the **Analog Devices ADuCM320 CPU Support Package** link.
- Select the **Samples Solutions** > **ADuCM320 Samples Solution** link.

ADuCM320 CMSIS-DSP Samples Solution

This solution contains sample projects that use the CMSIS-DSP library running on ADuCM320 devices. To open the ADuCM320 CMSIS-DSP Samples Solution:

- Select the **Tools** > **Show Installed Packages** menu item.
- Select the **Analog Devices ADuCM320 CPU Support Package** link.
- Select the **Sample Solutions** > **ADuCM320 CMSIS-DSP Samples Solution** link.

ADuCM320 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 ADuCM320 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 ADuCM320 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 **ADuCM320 Devices** section for details on the files, preprocessor definitions and macro definitions used when a device is selected.

ADuCM320 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="ADuCM320_EXE">
    <configuration Name="Common" package_dependencies="ADuCM320" Target="ADuCM320" />
    <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="ADuCM320_EXE">
    <configuration Name="Common" package_dependencies="ADuCM320" Target="ADuCM320"
 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 ADuCM320 project templates

Template Name	Template Description
ADuCM320_ASM_EXE	ADuCM320 Assembly Code Only Executable
ADuCM320_CTL_EXE	ADuCM320 CTL Executable
ADuCM320_EXE	ADuCM320 C/C++ Executable
ADuCM320_EXT_EXE	ADuCM320 Externally Built Executable
ADuCM320_LIB	ADuCM320 Library

ADuCM320 Devices

This package supports the following ADuCM320 devices:

- **ADuCM320**
- **ADuCM320i**
- **ADuCM322**
- **ADuCM322i**

ADuCM320

Device Details	
CMSIS Header File	$(TargetsDir)/ADuCM320/CMSIS/Device/Include/ADuCM320.h
CMSIS Include Path	$(TargetsDir)/ADuCM320/CMSIS/Device/Include
CMSIS System File	$(TargetsDir)/ADuCM320/CMSIS/Device/Source/system_ADUCM320.c
Family	ADuCM320
Loader File	$(TargetsDir)/ADuCM320/Loader/ADuCM32x_Series_Loader.elf
Memory Map File	$(TargetsDir)/ADuCM320/XML/ADuCM320_MemoryMap.xml
Register Definition File	$(TargetsDir)/ADuCM320/XML/ADuCM320_Registers.xml
Vectors File	$(TargetsDir)/ADuCM320/Source/ADuCM320_Vectors.s

Preprocessor Definitions
ADuCM320
ARM_MATH_CM3
__ADuCM320_FAMILY

Memory Segments	
FLASH	0x00000000 - 0x0003FFFF
RAM	0x20000000 - 0x20007FFF

Project Macros
DeviceIncludePath=$(TargetsDir)/ADuCM320/CMSIS/Device/Include
DeviceHeaderFile=$(TargetsDir)/ADuCM320/CMSIS/Device/Include/ADuCM320.h
DeviceLoaderFile=$(TargetsDir)/ADuCM320/Loader/ADuCM32x_Series_Loader.elf
DeviceRegisterDefinitionFile=$(TargetsDir)/ADuCM320/XML/ADuCM320_Registers.xml
DeviceSystemFile=$(TargetsDir)/ADuCM320/CMSIS/Device/Source/system_ADUCM320.c
DeviceVectorsFile=$(TargetsDir)/ADuCM320/Source/ADuCM320_Vectors.s
DeviceFamily=ADuCM320

ADuCM320i

Device Details	
CMSIS Header File	$(TargetsDir)/ADuCM320/CMSIS/Device/Include/ADuCM320i.h
CMSIS Include Path	$(TargetsDir)/ADuCM320/CMSIS/Device/Include
CMSIS System File	$(TargetsDir)/ADuCM320/CMSIS/Device/Source/system_ADUCM320I.c
Family	ADuCM320
Loader File	$(TargetsDir)/ADuCM320/Loader/ADuCM32x_Series_Loader.elf
Memory Map File	$(TargetsDir)/ADuCM320/XML/ADuCM320i_MemoryMap.xml
Register Definition File	$(TargetsDir)/ADuCM320/XML/ADuCM320i_Registers.xml
Vectors File	$(TargetsDir)/ADuCM320/Source/ADuCM320i_Vectors.s

Preprocessor Definitions
ADuCM320i
ARM_MATH_CM3
__ADuCM320_FAMILY

Memory Segments	
FLASH	0x00000000 - 0x0003FFFF
RAM	0x20000000 - 0x20007FFF

Project Macros
DeviceIncludePath=$(TargetsDir)/ADuCM320/CMSIS/Device/Include
DeviceHeaderFile=$(TargetsDir)/ADuCM320/CMSIS/Device/Include/ADuCM320i.h
DeviceLoaderFile=$(TargetsDir)/ADuCM320/Loader/ADuCM32x_Series_Loader.elf
DeviceRegisterDefinitionFile=$(TargetsDir)/ADuCM320/XML/ADuCM320i_Registers.xml
DeviceSystemFile=$(TargetsDir)/ADuCM320/CMSIS/Device/Source/system_ADUCM320I.c
DeviceVectorsFile=$(TargetsDir)/ADuCM320/Source/ADuCM320i_Vectors.s
DeviceFamily=ADuCM320

ADuCM322

Device Details	
CMSIS Header File	$(TargetsDir)/ADuCM320/CMSIS/Device/Include/ADuCM322.h
CMSIS Include Path	$(TargetsDir)/ADuCM320/CMSIS/Device/Include
CMSIS System File	$(TargetsDir)/ADuCM320/CMSIS/Device/Source/system_ADUCM322.c
Family	ADuCM320
Loader File	$(TargetsDir)/ADuCM320/Loader/ADuCM32x_Series_Loader.elf
Memory Map File	$(TargetsDir)/ADuCM320/XML/ADuCM322_MemoryMap.xml
Register Definition File	$(TargetsDir)/ADuCM320/XML/ADuCM322_Registers.xml
Vectors File	$(TargetsDir)/ADuCM320/Source/ADuCM322_Vectors.s

Preprocessor Definitions
ADuCM322
ARM_MATH_CM3
__ADuCM320_FAMILY

Memory Segments	
FLASH	0x00000000 - 0x0003FFFF
RAM	0x20000000 - 0x20007FFF

Project Macros
DeviceIncludePath=$(TargetsDir)/ADuCM320/CMSIS/Device/Include
DeviceHeaderFile=$(TargetsDir)/ADuCM320/CMSIS/Device/Include/ADuCM322.h
DeviceLoaderFile=$(TargetsDir)/ADuCM320/Loader/ADuCM32x_Series_Loader.elf
DeviceRegisterDefinitionFile=$(TargetsDir)/ADuCM320/XML/ADuCM322_Registers.xml
DeviceSystemFile=$(TargetsDir)/ADuCM320/CMSIS/Device/Source/system_ADUCM322.c
DeviceVectorsFile=$(TargetsDir)/ADuCM320/Source/ADuCM322_Vectors.s
DeviceFamily=ADuCM320

ADuCM322i

Device Details	
CMSIS Header File	$(TargetsDir)/ADuCM320/CMSIS/Device/Include/ADuCM322.h
CMSIS Include Path	$(TargetsDir)/ADuCM320/CMSIS/Device/Include
CMSIS System File	$(TargetsDir)/ADuCM320/CMSIS/Device/Source/system_ADUCM322.c
Family	ADuCM320
Loader File	$(TargetsDir)/ADuCM320/Loader/ADuCM32x_Series_Loader.elf
Memory Map File	$(TargetsDir)/ADuCM320/XML/ADuCM322i_MemoryMap.xml
Register Definition File	$(TargetsDir)/ADuCM320/XML/ADuCM322_Registers.xml
Vectors File	$(TargetsDir)/ADuCM320/Source/ADuCM322_Vectors.s

Preprocessor Definitions
ADuCM322
ARM_MATH_CM3
__ADuCM320_FAMILY

Memory Segments	
FLASH	0x00000000 - 0x0003FFFF
RAM	0x20000000 - 0x20007FFF

Project Macros
DeviceIncludePath=$(TargetsDir)/ADuCM320/CMSIS/Device/Include
DeviceHeaderFile=$(TargetsDir)/ADuCM320/CMSIS/Device/Include/ADuCM322.h
DeviceLoaderFile=$(TargetsDir)/ADuCM320/Loader/ADuCM32x_Series_Loader.elf
DeviceRegisterDefinitionFile=$(TargetsDir)/ADuCM320/XML/ADuCM322_Registers.xml
DeviceSystemFile=$(TargetsDir)/ADuCM320/CMSIS/Device/Source/system_ADUCM322.c
DeviceVectorsFile=$(TargetsDir)/ADuCM320/Source/ADuCM322_Vectors.s
DeviceFamily=ADuCM320