Getting started with Eclipse IDEs
and Arm MDK for the Arm CMSIS-DSP library

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1. Overview

This document describes the steps required to integrate the Arm CMSIS-DSP library with C code generated from the ASN Filter Designer's CMSIS-DSP C code generator into an Eclipse-based IDE STM32CUBE-IDE and Arm MDK (µVision IDE). The steps mentioned in this document are common for other Eclipse-based IDEs, and therefore portable. As an example, we will generate a project in the STM32CUBE-IDE and for the STM32F446RE microcontroller based on a Cortex-M4.

The content is as follows:

- Steps for including the Arm CMSIS-DSP library in Eclipse-based IDE project
- Steps for including the Arm CMSIS-DSP library to Arm's µVision IDE

2. Steps for including the Arm CMSIS-DSP library in Eclipse-based IDE project

1. Clone the CMSIS git repository in a separate folder using the command
   `git clone https://github.com/ARM-software/CMSIS.git`

   you should see the following file structure in the repository.

📁 CMSIS	27-Jul-21 4:38 PM	File folder	
📁 Device	27-Jul-21 4:38 PM	File folder	
📄 ARM.CMSIS.pdsc	27-Jul-21 4:38 PM	PDSC File	78 KB
📄 README.md	27-Jul-21 4:38 PM	MD File	2 KB

2. Create a folder in your project and name it `DSP`. We have to copy all the CMSIS dependences in this folder.

3. Open the CMSIS repository navigate to `CMSIS\Lib\GCC` path and copy the `libarm_cortexM4lf_math.a` file (Cortex-M4) and paste it in the `DSP\Lib` folder in your project. For Cortex-M7 based microcontroller projects, copy `libarm_cortexM7l_math.a`, for Cortex-M3 `libarm_cortexM3l_math.a`, and finally for Cortex-M0 `libarm_cortexM0l_math.a`

4. Navigate to the `CMSIS` folder in your repository, copy the Include folder and paste it into the DSP folder in your project.
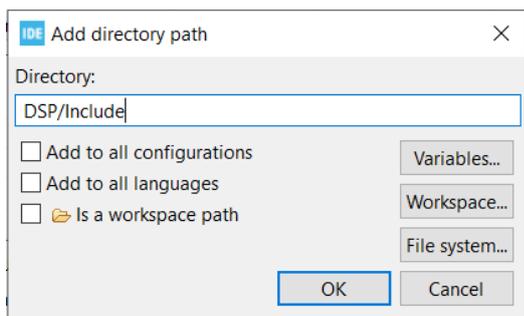
 | | | | |
   |---|---|---|---|
   | 📁 Include | 27-Jul-21 4:44 PM | File folder | |
   | 📁 Lib | 27-Jul-21 4:53 PM | File folder | |

Continued overleaf

5. Now to add CMSIS header files to the project: go to **project properties** and navigate to **Paths and Symbols** under the option **C/C++ General**.
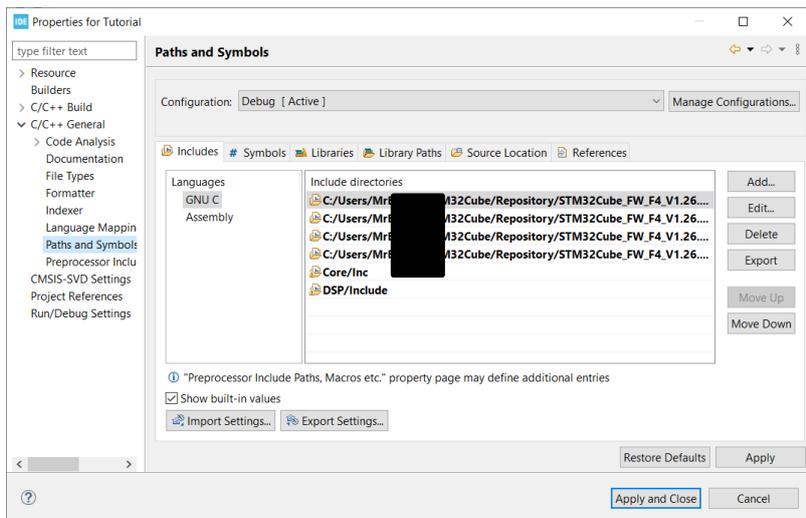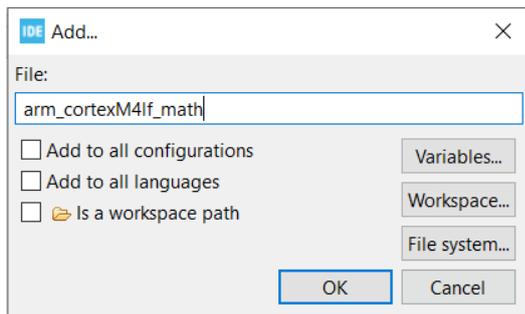

6. Click on the **Add** option and type `DSP/Include` in the popup and then click **OK**.

7. Click on the **Library Paths** tab and then click on the **Add** button. Type `DSP/Lib` in the popup and click on the **OK** button.
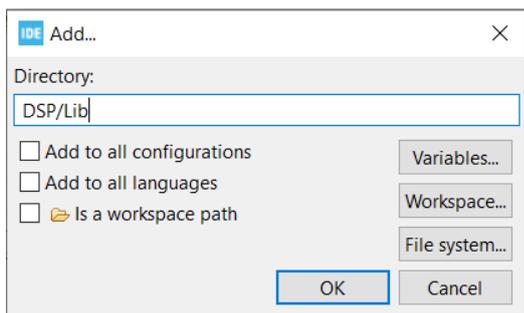
8. Click on the **Libraries** tab and then click on the **Add** button. Type `arm_cortexM4lf_math` in the popup and click on the OK button.

Remove the `lib` prefix and `.a` extension from the library file name to get specific text to be added to the microcontroller platform.

9. Click on the **Symbols** tab and then click on the **Add** button. Type `ARM_MATH_CM4` (if using a Cortex-M4) in the popup and click on the OK button.
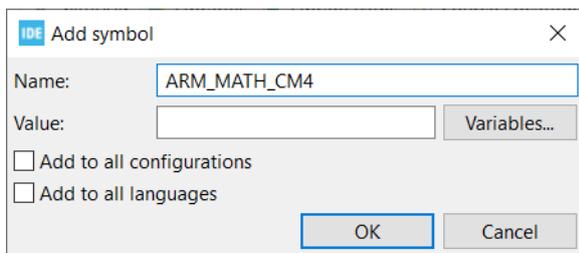

Please refer to the table below for symbol definition for other cores.

|			
`ARM_MATH_CM0`	Cortex-M0 core.	`ARM_MATH_CM4`	Cortex-M4 core.
`ARM_MATH_CM0PLUS`	Cortex-M0+ core.	`ARM_MATH_CM7`	Cortex-M7 core.
`ARM_MATH_CM3`	Cortex-M3 core.		
`ARM_MATH_ARMV8MBL`	ARMv8M Baseline target (Cortex-M23 core).		
`ARM_MATH_ARMV8MML`	ARMv8M Mainline target (Cortex-M33 core).		

10. Now click apply and close button, now copy the code you have generated using the ASN Filter Designer to `main.c` and build the project.

3. Steps for including the Arm CMSIS-DSP library to Arm's µVision IDE

1. Open your µvision project.

2. Navigate to the `Manage Run-Time Environment` option.
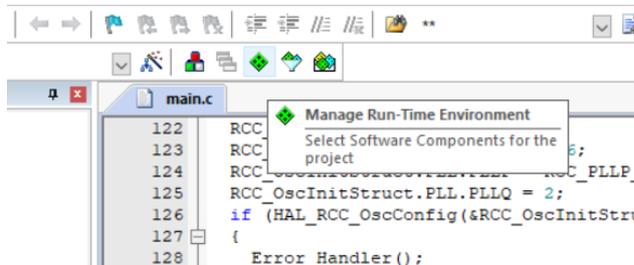
3. As shown below, you should see a popup, click on `CORE` and `DSP` checkboxes under `CMSIS` and then press the **OK** button.
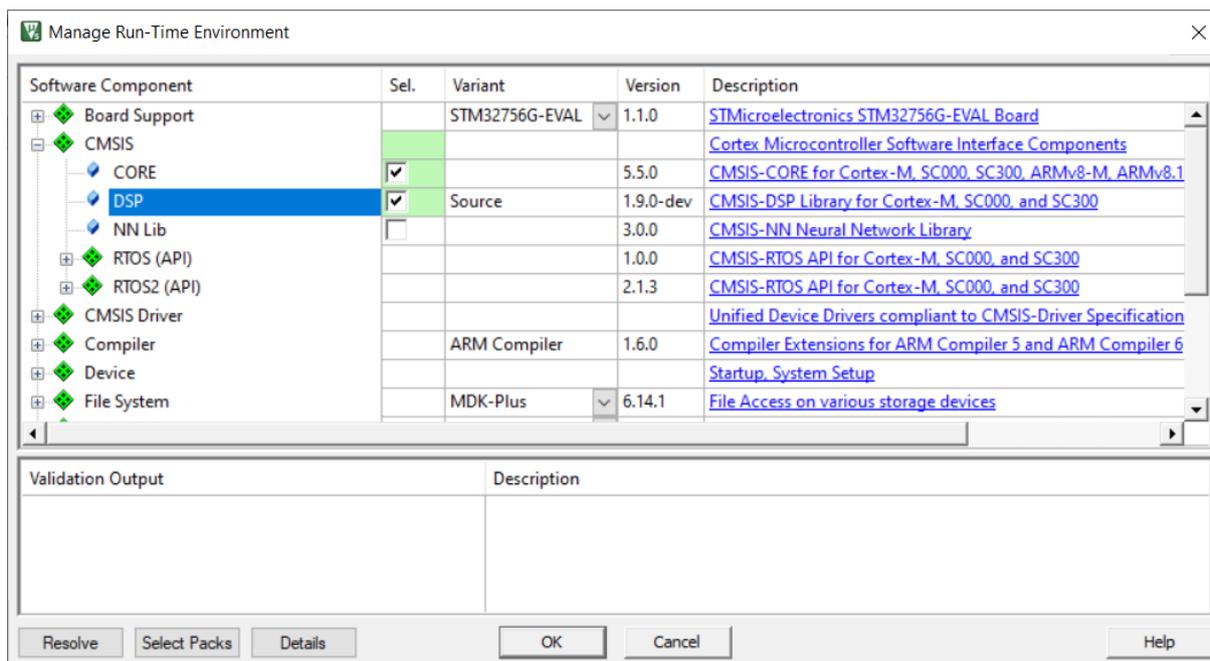
The IDE will then automatically add the necessary files to your project.

Document Revision Status

Rev.	Description	Date
1	Document released	29/07/2021