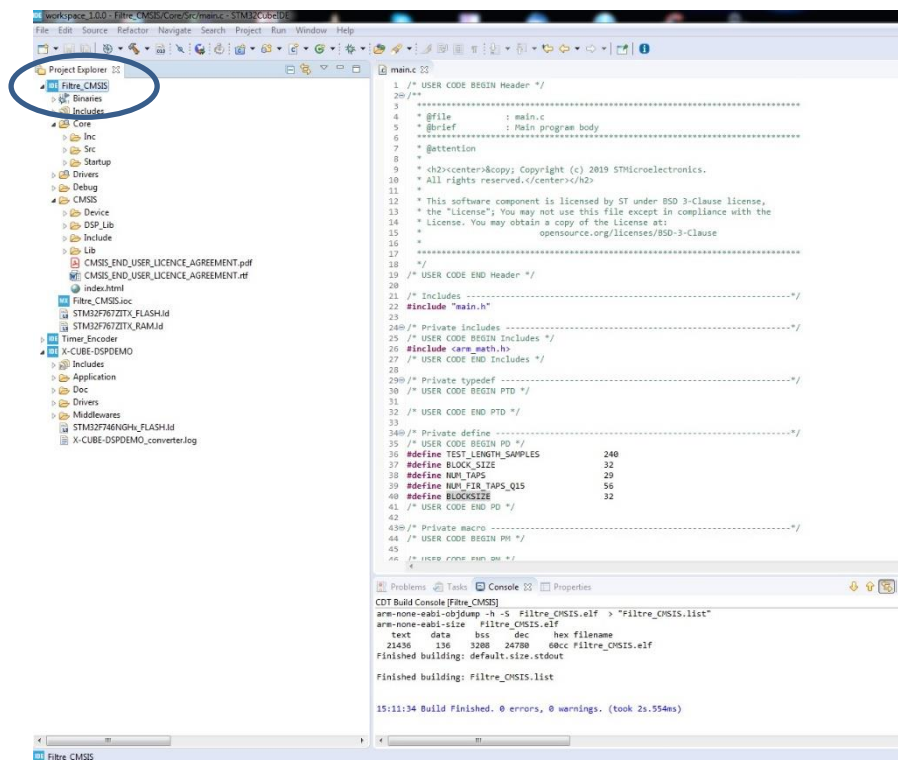


# TUTORIAL CMSIS

The aim of this document is to explain how to add some ARM CMSIS libraries in a STM32CubeIDE project. This add is not trivial and several steps are needed.

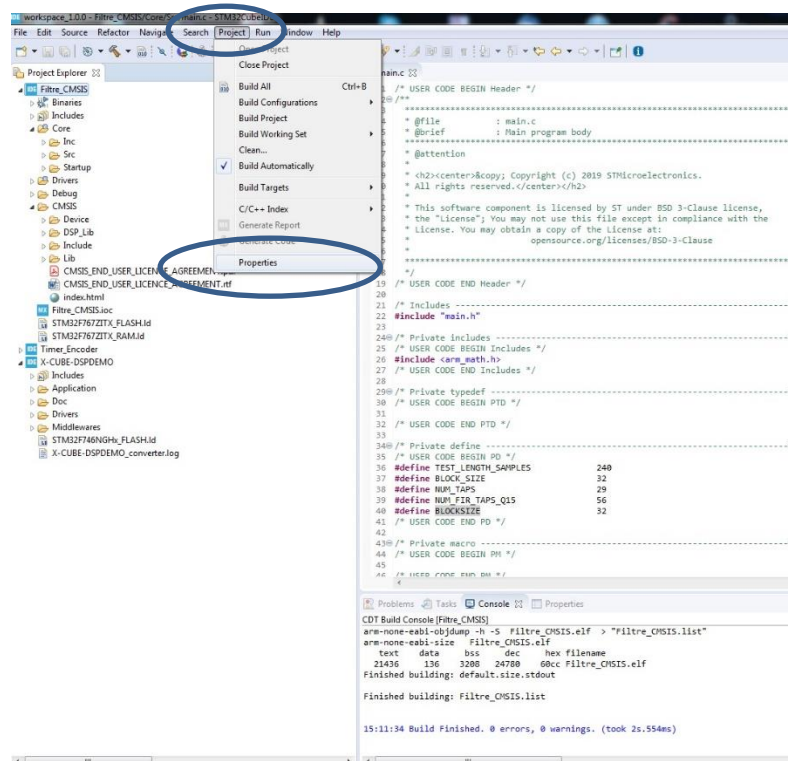
The first step is to add the needed paths for the compiler and the linker in order to find the include files and the library that you want to use.

The figure 1 shows that in a first time, you have to choose the project to which you want to add the libraries.



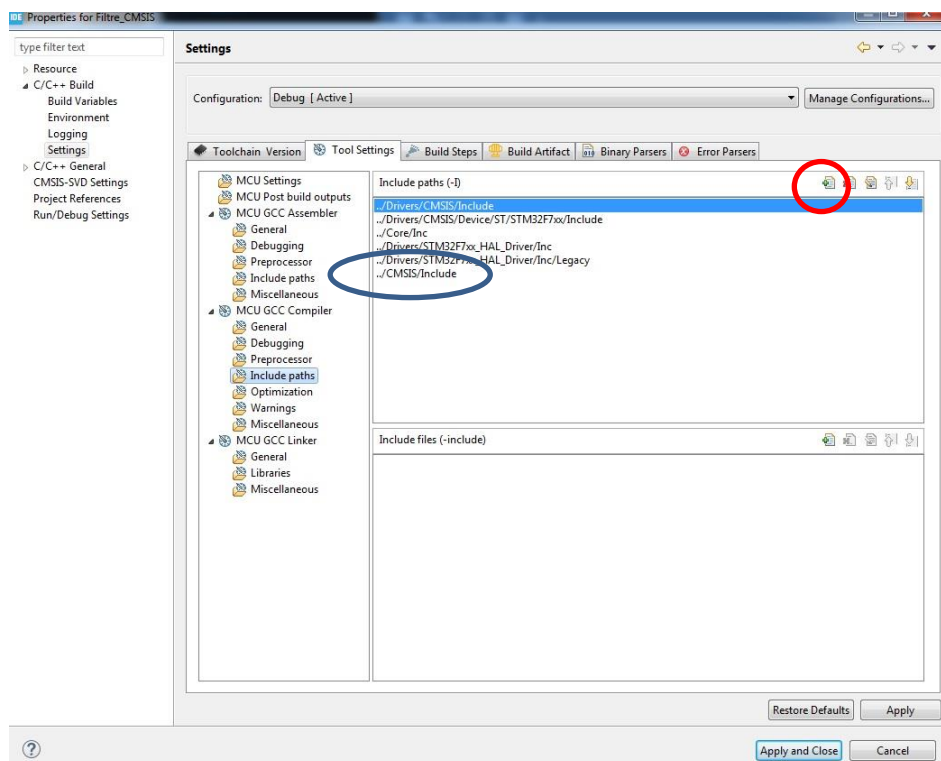
**FIGURE 1: SELECTION OF THE PROJECT IN WHICH WE WANT TO ADD THE LIBRARIES**

In the second step, we must edit the properties of the project as presented in figure 2.



**FIGURE 2: SELECTION OF THE PROJECT PROPERTIES**

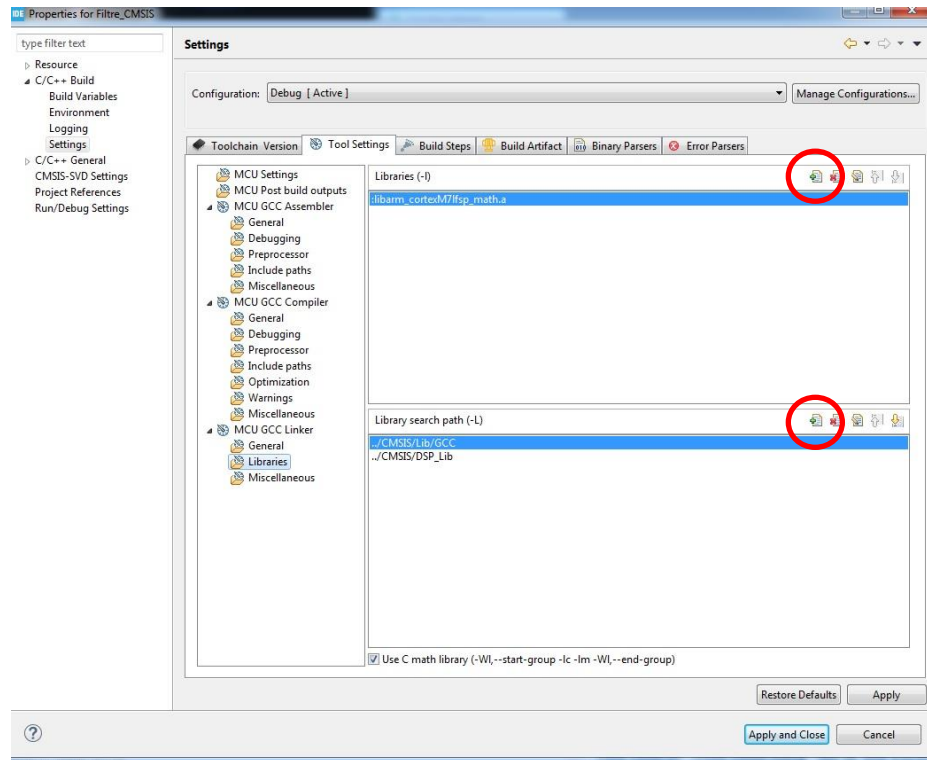
Next step, choose the Settings tab in C/C++ build and the Include path tab in the MCU GCC Compiler as shown in figure below.



**FIGURE 3: ADDING PATHS FOR THE INCLUDE FILES**

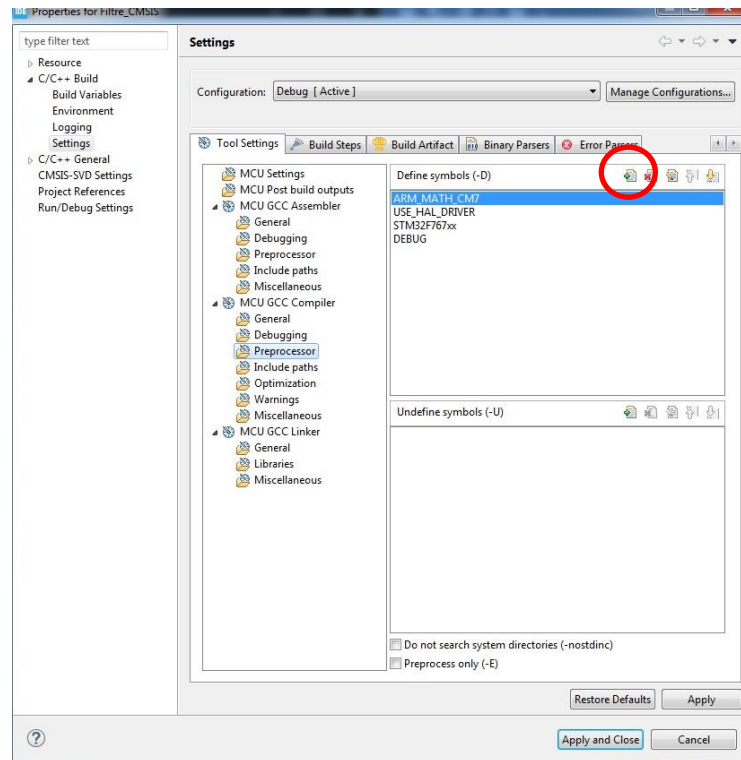
Be careful, here I copied the directory of the CMSIS library into the one created for the project.

To add this path you have just to click on the tab encircled in red in the Figure 3. The path is added in the relative mode here. Then, we must add the name and the path in order to find the libraries that we want to use. In this example, I want to use the library named libarm\_cortexM7lfsp\_math.a (we use libraries for GCC if you use MDK-ARM the library is not the same one). This library contains among other things the DSP functions (FIR, FFT and so on). This Lib is in the CMSIS/Lib folder and the sources are in the CMSIS/DSP\_Lib folder. All this information are added as shown in Figure 4.



**FIGURE 4: ADDING PATHS TO FIND THE LIBRARY AND ADDING OF THE LIBRARY NAME**

The additions are done as before by clicking on the tab circled in red. A final step is necessary for the compilation to go well. As the arm\_math.h file (file to add absolutely at the beginning of the program) is a file using the conditional compilation, we have to add a variable in the Preprocessor; This variable allows us to specify to the compiler what is the hardware target used (here the cortex M7). This addition is shown in the figure below and it is realized as before by clicking on the tab circled in red.



**FIGURE 5: ADDING THE HARDWARE VARIABLE NAME FOR THE CONDITIONAL COMPILATION.**