

Spring Semester, 2023

CSE411: Embedded Systems

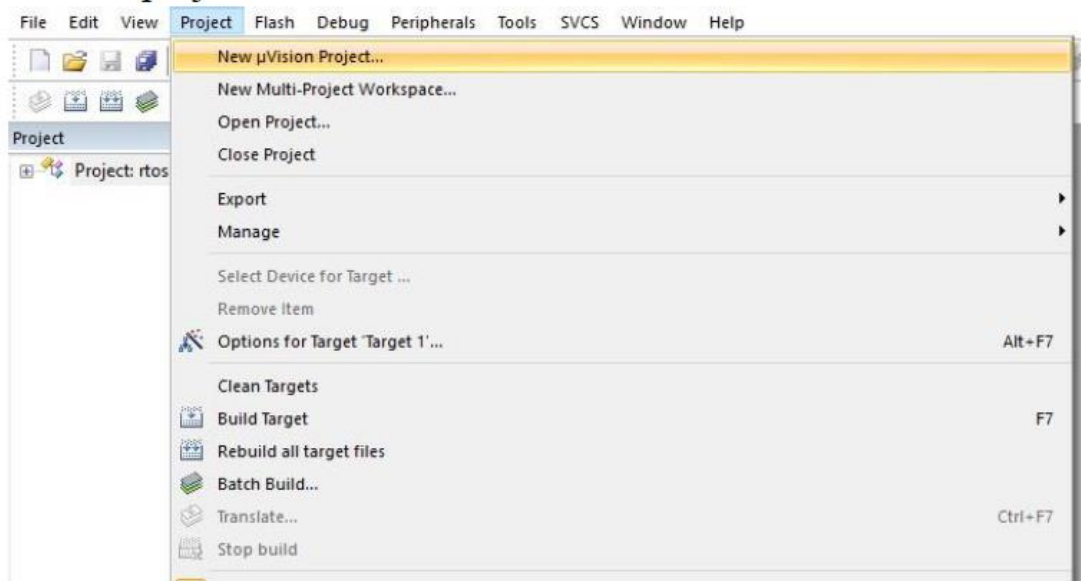
Lab (4): Introduction to FreeRTOS

Goals of this Lab:

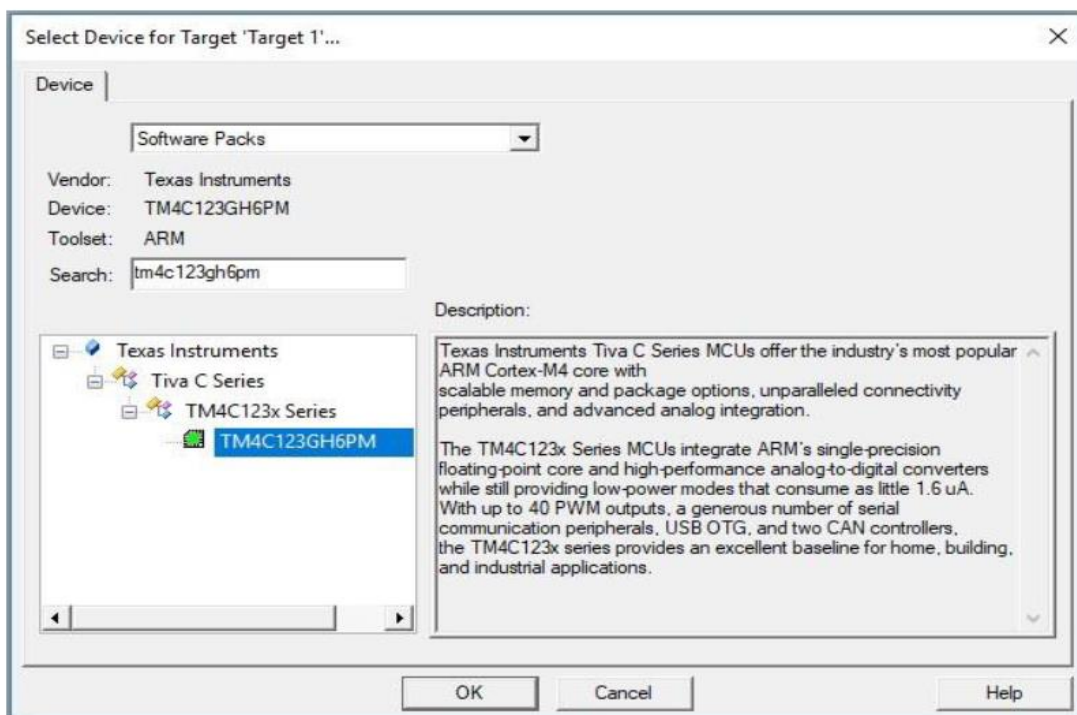
- Create a new project on keil with FreeRTOS integrated.
- Create tasks in FreeRTOS.

Task 1: Initialize the MicroController

1- Create a new project on Keil



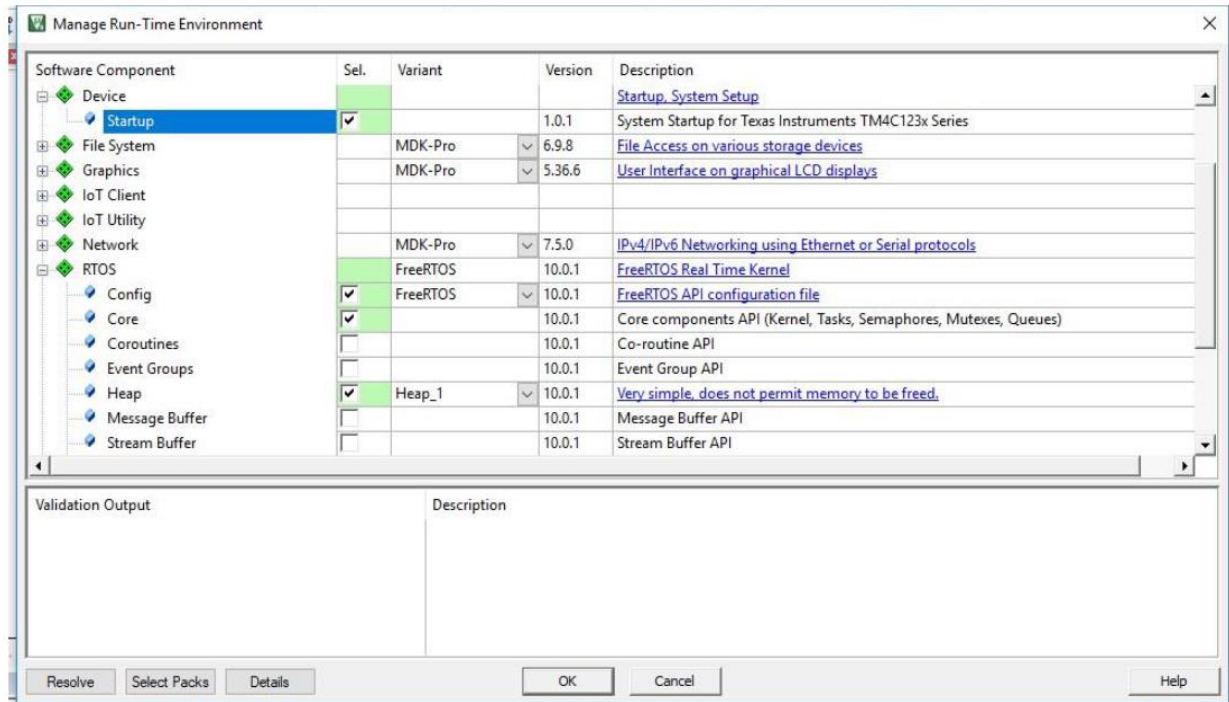
2- Save your project in the desired place, and choose the target



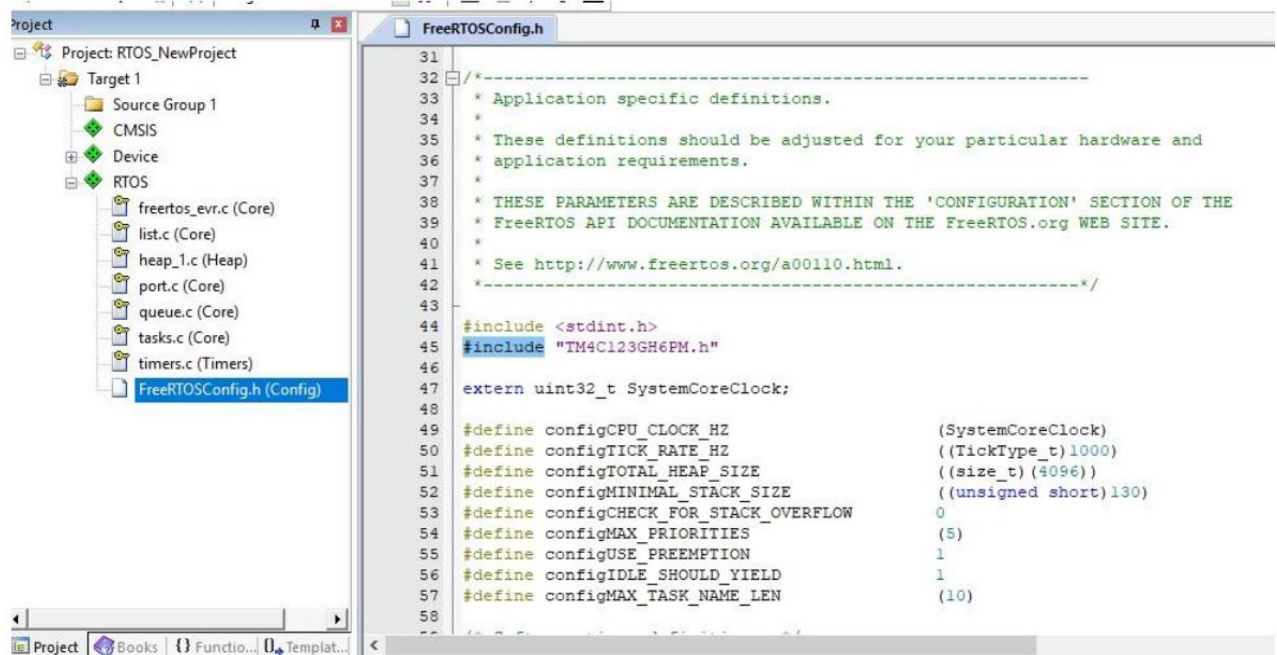
3- In the Manage Run Time Environment window, check the following boxes:

- CMSIS -> Core
- Device -> startup - RTOS -> Config
- Core

Heap (select Heap_1 from the drop down box)
Timers



4- In the Project menu on the left side Open the RTOS folder and open the file FreeRTOSConfig.h and include “TM4C123GH6PM.h” inside it.



5- Create a new main.c file, and start your code.

Task 2: Initialize Tasks

- Create a function that contains a for loop without conditions, ie: `for(; ;)`, make sure that this function is implemented outside the main function.
- Inside the for Loop, implement a function that every time it get executed it toggles the RED LED
- Using the `xTaskCreate` API create a task and assign the function to it as per section 1.4 in the attached document



Richard Barry-Using the FreeRTOS Real Time Kernel - A Practical Guide - Cortex-M3 Edition.pdf

- After creating the task start the task by calling the scheduler function `"vTaskStartScheduler();"`
- Just before you start running the code, call the `vTaskDelay()` after calling the function that toggles the RED LED. Assign a 1000ms delay in the task