Task management and delays in uC/OS-II

1 Introduction

This lab is the first lab concerning the real-time kernel uC/OS-II and its use on the `LPC_2378_STK` development board. At the end of the lab, you should know:

- how to create a project to use uC/OS-II
- how to write `main.c` to create tasks and execute them
- how to suspend tasks by using delays

2 In the lab

1. Download the file workspace.zip into a suitable directory either on a pen drive or in your University workspace. I suggest you call the directory `EN572/labs/lab05`. Unzip `workspace.zip`.
2. Start up EWARM and load the workspace `workspace/workspace.eww`.
3. Connect a `LPC-2378-STK` board to a USB port on your computer.
4. Before starting on the work on uC/OS-II, make sure that you understand the solution to `lab04` – it's in the project `lab04S`. Download and debug this project. Test the program. Make sure that you understand how interrupt handlers are installed and how the timers are configured.
5. Download and debug the project `lab05`. Run it and observe its behaviour. It's yet another program to flash the leds. But this time the flashing is controlled by 2 uC/OS-II tasks.
6. Notice the code organisation. There is now another major group, `Micrium`. This is where the code for the uC/OS-II operating system resides. You should never need to modify code in this group.
7. Read `main.c` and make sure you understand exactly how it works. If you have any doubts about any aspect, ask your tutor to explain it to you.

8. In order to test your understanding of what you've looked at so far, modify `main.c` to add a third task to poll the state of the buttons at 100 Hz. Write the code needed to change the behaviour of the program so that button 1 must be pressed to start the leds flashing and button 2 stops the leds flashing. Test and debug your program.

9. When your program is working satisfactorily, extend it so that the rate of flashing of the leds is controlled by the joystick. Pressing the joystick up should increase the rate of flashing and pressing the joystick down should decrease it.