ECGR4982/6185/8185, Spring 2006: Lab 1

Porting MicroC/OS-II to the Renesas Board

Learning Objectives

This lab will help you understand how to build a project and load the MicroC/OS operating system onto a Renesas board.

Hardware Requirements

A processor can run MicroC/OS-II if it satisfies the following requirements:

1. The processor has a C compiler that generates reentrant code.
2 Interrupts can be disabled and enabled from C.
3 The processor supports interrupts and can provide interrupt that occurs at regular intervals
4 The processor supports a hardware stack of at least 5 kilobytes.
5 The processor has instructions to load and store the stack pointer and other CPU registers either on stack or in memory.

Prelab

Read the main.c file in the test folder to gain a better understanding of the MicroC/OS II port for the Renesas board. You are allowed (and encouraged) to modify this file for the lab.

Laboratory Assignments - STEPS REQUIRED:

This port is a modified port of Hubert Kronenberg for M16C family to run on SKP16C62P. Tools needed to complete this project:

1. NC30 compiler version 5.3 release 2- a trial version can be downloaded from http://download.sg.renesas.com/evaluation_software/compilers/m16c/
2 MicroC/OS-II source files- all source files in the companion CD-ROM with MicroC/OS-II book
3 Flash over USB (version 2.4)-setup is in the companion CD of SKP16C62P kit.
4 The project code

Steps needed to complete this project:

1. Downloading ports from http://www.ucos-ii.com/
2 Modifying the code.
3 Copying the OS (version 2.52) files to folder “V270”.
4 Making necessary changes to the path in uCOS_II.C file.
5 Installing NC30 Compiler to C:\renesas\NC30WA\
6 Making necessary changes in mk.bat and set it for the default path.
7 Executing the mk.bat.
8 Loading main.mot on microcontroller using flash over USB(version 2.4)

Requirements

Req. 1 – The code generated is written in C for the Renesas SKP16C62P board.
Req. 2 – There should be three tasks running on your embedded target.
Req. 3 – Correctly initialize UART 0 in the main program.
Req. 4 – Task 1 should send 'R' via the RS232c line from the Renesas board to a PC running HyperTerminal and toggle the red LED every 5 seconds.
Req. 5 – Task 2 should send 'G' via the RS232c line from the Renesas board to a PC running HyperTerminal and toggle the green LED every 10 seconds.
Req. 6 – Task 3 an interrupt-based task which should receive a byte from the PC running HyperTerm. If that byte is 'T' then display temperature on the LCD of Renesas kit and toggle yellow LED. If the char is not ‘T’, ignore the character.
Req. 7 – Create the necessary hardware circuit to communicate between a PC and your Renesas board using the MAX232 chip and passive components.

Lab Report

Include in your lab report observations and procedure like the following:

The general learning objectives of this lab were . . .

The general steps needed to complete this lab were . . .

Some detailed steps to complete this lab were . . . .

1. *Step one*
2. *Step two*
3. *. . . .*

Code generated or modified to complete this lab...

No need to include all the files for the lab. Just include the modified code.

Some important observations while completing/testing this lab were . . .

Here include the memory report given at the end of the compile process.

In this lab we learned . . . .