LAB 06: Real Time Clock Intro

Abstract

This lab will get you more familiar with using registers and give you a brief insight to using the real time clock hardware. It is an intro to the RTC and does not exhaust all features of it. No using built in functions unless stated

Pre-Lab

- ☐ Read the Real Time Clock (RTC) chapter in the datasheet. You can skip the section about Clock Calibration and Waveform Generation
- ☐ Read through the register mapping of the RTC and browse through the individual registers. (You are going to be working with these registers so dont skip this step).
- ☐ Read in the data sheet about the SYS_WPMR register
- ☐ Make a copy of your SoC-Lab05 folder and rename it SoC-Lab06 and edit the file names as you did in the previous labs

Steps (check the boxes as you complete them)

- ☐ In main.c, add the following 2 functions to your code, and make appropriate user menu items for them: *setup_rtc()* and *print_time()*
- ☐ In *setup_rtc* do the following and in this order.
  - ☐ Disable write protection of the RTC registers by writing to the System Controller Write Protection Mode Register (SYSC_WPMR) register. (Note, the address of the SYSC_WPMR register is not specifically given in the data sheet. However, you can calculate it. Start by looking at table 22-1)
  - ☐ In the mode register, set the clock to 12 hour mode, gregorian calender, no error correction, no output sources.
  - ☐ Enable update of the time and calendar by writing the appropriate values to the control register
  - ☐ Wait until the time and calendar registers can by updated by continuously polling the 'acknowledge for update bit' in the status register
  - ☐ Clear the 'acknowledge for update bit'
  - ☐ Set a valid calendar date.
  - ☐ Set a valid clock time
    (*Note: The date and time both require binary coded decimal (BCD) formats.)
  - ☐ Check to ensure that your clock and calendar times are valid by checking the RTC Valid Entry Register
  - ☐ Reconfigure the control register to start the calendar and clock counting
  - ☐ Enable write protection in the SYSC_WPMR register
- ☐ It would be a good idea at this point to make sure that the values you think you are storing in the calendar and time registers are actually being stored the way you think they are
- ☐ Fill in code in the *print_time()* function to print the time.

For Credit

- ☐ Make sure your code runs and there are no bugs in it.
- ☐ Load the code onto the board and set it up in debug mode. Call the professor over
- ☐ Answer his questions

——— Your Name ———

——— Approved Date ———