Atmel SAM4L Xplained Pro – Data Acquisition

ELC 4438 Lab Manual

March 21st, 2016

1. Connect the Atmel SAM4L board with **IO1 (EXT1)** and **OLED1 (EXT3)** extension boards.

   You need to generate square waves with different frequencies and put the signals through PWM pin (pin 8 on EXT1) on the **IO1** board as the low-pass filter input.

   Let BUTTON1 (pin 9 on EXT3), BUTTON2 (pin 3 on EXT3) and BUTTON3 (pin 4 on EXT3) on the **OLED1** extension board determine the frequency of the square wave.

   Note: You have generated square waves with different frequencies when you did the blinking LED lab assignment.

   Check the resulting square wave and the output of low pass filter using the Agilent MSO-X 3024A oscilloscope.

$$fc = \frac{1}{2\pi RC} \text{ in Hertz}$$
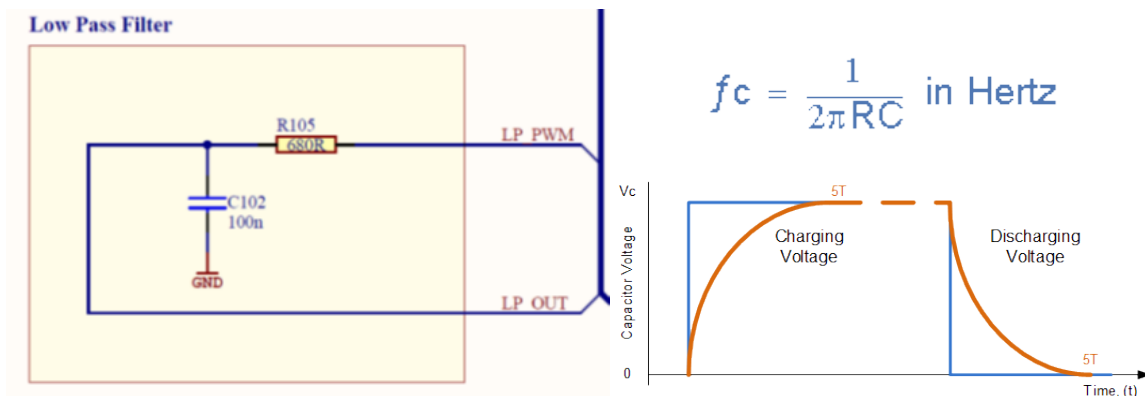
2. Load the **ADCIFE Window Monitor Example** from New Example Project and modify it so that it can measure voltage from pin 4 in EXT1.

   Refer to the previous lab ADCIFE (Multimeter) on how to set the ADC parameters.

3. Combine your program from 1 (low-pass filter) with the ADCIFE program.

   Sample the low-pass filter output using ADC through LP_OUT pin (pin 4 in EXT1) on the **IO1** board for at least two periods.

   Make sure that the ADCIFE samples at its maximum frequency and with maximum voltage 3.3V instead of just 0.625*3.3V = 2.06V.

   Put the result into PuTTY terminal and copy it (Right-click – Copy All to Clipboard) to Excel and plot it. You can also set Putty log file to record the data. You should have at least 3 waveforms with different frequencies. See figures below.

   Alternatively, you can write the result into a text file in the MicroSD.
   See **SD/MMC/SDIO Card FatFs Example (SD_MMC_EXAMPLE21)** on how to write onto the MicroSD.
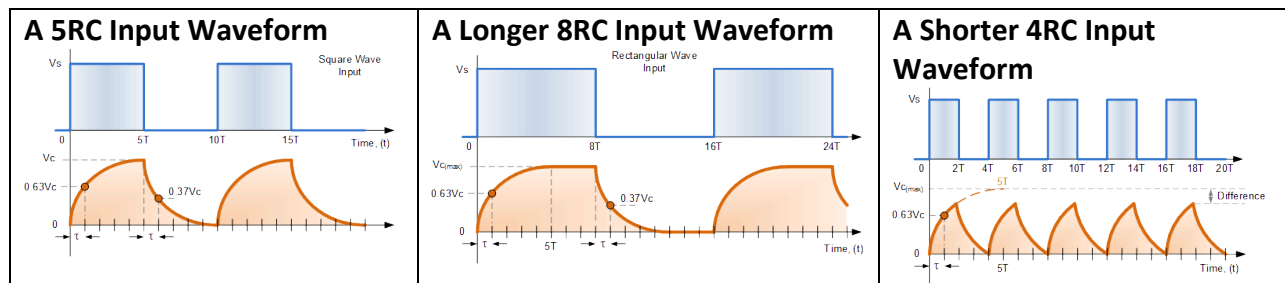
Show the results and explain your program to your TA.