Recap

Analog to Digital Convertor
Using output compare interrupts to establish sampling

Overview

ADC Convertor techniques
ADC software
OC periodic interrupts
Importing LCD code into Lab6 project

Address	Bit 7	6	5	4	3	2	1	Bit 0	Name
$0040	IOS7	IOS6	IOS5	IOS4	IOS3	IOS2	IOS1	IOS0	TIOS
$0044-5	Bit 15	14	13	12	11	10		Bit 0	TCNT
$0046	TEN	TSWAI	TSFRZ	TFFCA	0	0	0	0	TSCR1
$004C	C7I	C6I	C5I	C4I	C3I	C2I	C1I	C0I	TIE
$004D	TOI	0	PUPT	RDPT	TCRE	PR2	PR1	PR0	TSCR2
$004E	C7F	C6F	C5F	C4F	C3F	C2F	C1F	C0F	TFLG1
$004F	TOF	0	0	0	0	0	0	0	TFLG2
$0050-1	Bit 15	14	13	12	11	10		Bit 0	TC0
$0052-3	Bit 15	14	13	12	11	10		Bit 0	TC1
$0054-5	Bit 15	14	13	12	11	10		Bit 0	TC2
$0056-7	Bit 15	14	13	12	11	10		Bit 0	TC3
$0058-9	Bit 15	14	13	12	11	10		Bit 0	TC4
$005A-B	Bit 15	14	13	12	11	10		Bit 0	TC5
$005C-D	Bit 15	14	13	12	11	10		Bit 0	TC6
$005E-F	Bit 15	14	13	12	11	10		Bit 0	TC7
$0082	ADPU	AFFC	ASWAI	ETRIGLE	ETRIGP	ETRIG	ASCIE	ASCIF	ATD0CTL2
$0083	0	S8C	S4C	S2C	S1C	FIFO	FRZ1	FRZ0	ATD0CTL3
$0084	SRES8	SMP1	SMP0	PRS4	PRS3	PRS2	PRS1	PRS0	ATD0CTL4
$0085	DJM	DSGN	SCAN	MULT	0	CC	CB	CA	ATD0CTL5
$0086	SCF	0	ETORF	FIFOR	0	CC2	CC1	CC0	ATD0STAT0
$008B	CCF7	CCF6	CCF5	CCF4	CCF3	CCF2	CCF1	CCF0	ATD0STAT1
$008D	Bit 7	6	5	4	3	2	1	Bit 0	ATD0DIEN
$008F	PAD07	PAD06	PAD05	PAD04	PAD03	PAD02	PAD01	PAD00	PORTAD0
$0090-1	Bit 15	14	13	12	11	10		Bit 0	ATD0DR0
$0092-3	Bit 15	14	13	12	11	10		Bit 0	ATD0DR1
$0094-5	Bit 15	14	13	12	11	10		Bit 0	ATD0DR2
$0096-7	Bit 15	14	13	12	11	10		Bit 0	ATD0DR3
$0098-9	Bit 15	14	13	12	11	10		Bit 0	ATD0DR4
$009A-B	Bit 15	14	13	12	11	10		Bit 0	ATD0DR5
$009C-D	Bit 15	14	13	12	11	10		Bit 0	ATD0DR6
$009E-F	Bit 15	14	13	12	11	10		Bit 0	ATD0DR7

Successive Approximation

Cheap, accurate, 100 kHz

Flash

Expensive, accurate, extremely fast, 100 MHz

Sigma Delta

Cheap, very good resolution, not accurate, 44 kHz

Write ADC driver
- Review ADC bits
- show it on TExaS and real board

Write 1 kHz OC7 interrupt
- Review Timer bits
- show it on TExaS and real board
- ****Give an oscilloscope demonstration****

Import LCD code from Lab6
- show it on TExaS and real board

See Lab Manual about how to turn it in.

Deliverables (Items 1, 2, 3, 4, 5 are one docx/doc/pdf filed uploaded to Blackboard, have this file open during demo.)

0) Lab 8 grading sheet. You fill it out, but you can print it yourself or pick up copy in lab.

Create one doc docx or pdf file with the following for electronic submission (UTEID1_UTEID2.DOC***)***

1) A screenshot showing the ADC test running in simulation mode (part c)
2) Circuit diagram showing the position sensor and LCD, using PCB Artist),
3) Calibration data, like the first three columns of Table 8.1 (part d)
4) Final version of main program 4 with LCD, OC, ADC and PLL (parts c, e, f, g and h)
5) Accuracy data and accuracy calculation, Table 8.2

Upload to Blackboard a single zip file with

All your source code files: *.C, *.H, *.ASM (do not include project, lst, UC, IO, rtf files)
There should be absolutely no spaces in file and/or folder names.
The ZIP file name should be UTEID1_UTEID2.ZIP where UTEID1 and UTEID2 are in alphabetical order.
Both partners should submit the same zip file through Blackboard.
If you are doing an electronic submission, each student should be submitting two files: UTEID1_UTEID2.ZIP and UTEID1_UTEID2.DOC (DOCX and PDF files are also acceptable.) However, if a student is doing a paper submission, each student should still submit UTEID1_UTEID2.ZIP through Blackboard.

The bottom line

ADC converts analog to digital
Controlling time is important