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; Author : ADI - Apps www.analog.com/MicroConverter

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; Date : January 2001

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; File : Caluart.asm

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; Hardware : ADuC816

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; Description : sample program that performs ADC conversions in

; continuous mode and sends results to a PC via the

; UART.

; Program also accepts commands from the PC

; via incoming characters on the UART. an ASCII '0'

; innitiates a zero-scale calibration, and an ASCII

; '1' innitiates a full-scale calibration.

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$MOD816 ; Use 8052&ADuC816 predefined symbols

LED EQU P3.4 ; P3.4 drives red LED on eval board

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; BEGINNING OF CODE

CSEG

ORG 0000h

JMP MAIN

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; INTERRUPT VECTOR SPACE

ORG 0033h ; (ADC ISR)

CPL LED

MOV DPTR,#SEPERATOR ; send linefeed+CR out UART

CALL SENDSTRING

MOV A,ADC0H ; send ADC data via UART

CALL SENDVAL

MOV A,ADC0M

CALL SENDVAL

CLR RDY0

RETI

;====================================================================

; MAIN PROGRAM

ORG 0100h

MAIN:

MOV SP,#127

; CONFIGURE UART....

MOV RCAP2H,#0FFh ; config UART for 9830baud

MOV RCAP2L,#-5 ; (close enough to 9600baud)

MOV TH2,#0FFh

MOV TL2,#-5

MOV SCON,#01010010b

MOV T2CON,#00110100b

; CONFIGURE ADC....

MOV SF,#200 ; 6.8266667Hz ADC data rate

MOV ADC0CON,#045h ; externalVref, bipolar, ±640mV

SETB EADC ; enable ADC interrupt (trig on RDY0)

; START CONVERTING & WAIT FOR INTERRUPTS OR INCOMING UART COMS....

WAIT: SETB EA

CLR RDY0

MOV ADCMODE,#023h ; continuous conversion mode

CLR RI

JNB RI,$ ; wait here for UART command..

; ..or ADC interrupt

; WHEN UART COMMAND RECEIVED....

CLR EA ; disable interrupts

MOV ADCMODE,#021h ; put ADC in idle mode

MOV A,SBUF

CJNE A,#'0',NEXT01 ; if "0" received..

CALL CALZERO ; ..perform zero calibration

JMP WAIT

NEXT01: CJNE A,#'1',WAIT ; if "1" received..

CALL CALGAIN ; ..perform gain calibration

JMP WAIT

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; SUBROUTINES

CALZERO: ; perform zero-scale ADC calibration

MOV DPTR,#CALZSMSG ; send char to indicate..

CALL SENDSTRING ; ..begin zero calibration

CLR RDY0

MOV ADCMODE,#034 ; zero-scale self cal

; MOV ADCMODE,#036h ; zero-scale system cal

JNB RDY0,$

CLR RDY0

MOV DPTR,#CALDONEMSG ; send char to indicate..

CALL SENDSTRING ; ..calibraion complete

RET

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CALGAIN: ; perform full-scale ADC system calibration

MOV DPTR,#CALGNMSG ; send char to indicate..

CALL SENDSTRING ; ..begin gain calibration

CLR RDY0

MOV ADCMODE,#035 ; full-scale self cal

; MOV ADCMODE,#037h ; full-scale system cal

JNB RDY0,$

CLR RDY0

MOV DPTR,#CALDONEMSG ; send char to indicate..

CALL SENDSTRING ; ..calibration complete

RET

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; SUBROUTINE INCLUDE FILE

$INCLUDE(UARTIO.asm)

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; TEXT DATA TABLES

SEPERATOR: DB 10,13,0

CALZSMSG: DB 'Z',0

CALGNMSG: DB 'G',0

CALDONEMSG: DB 'x',0

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END