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/*    ADC.c
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 Runs on LM4F120/TM4C123
 Provide functions that initialize ADC0 SS3 to be triggered by
 software and trigger a conversion, wait for it to finish,
 and return the result.

*/

#include "tm4c123gh6pm.h"

//unsigned long equationRes;

// This initialization function
// Max sample rate: <=125,000 samples/second
// Sequencer 0 priority: 1st (highest)
// Sequencer 1 priority: 2nd
// Sequencer 2 priority: 3rd
// Sequencer 3 priority: 4th (lowest)
// SS3 triggering event: software trigger
// SS3 1st sample source: Ain1 (PE2)
// SS3 interrupts: flag set on completion but no interrupt requested

void ADC_Init(void){
        volatile unsigned long delay;
        SYSCTL_RCGC2_R |= 0X00000010;   //  activate clock for Port E
  delay = SYSCTL_RCGC2_R;           //  allow time for clock to stabilize
  GPIO_PORTE_DIR_R &= ~0X04;        //  make PE4 input
  GPIO_PORTE_AFSEL_R |= 0X04;       //  enable alternate function on PE2
        GPIO_PORTE_DEN_R &= ~0X04;      //  disable digital I/O on PE2
        GPIO_PORTE_AMSEL_R |= 0X04;     //  enable analog function on PE2
        SYSCTL_RCGC0_R |= 0X00010000;   //  activate ADCLK
        delay = SYSCTL_RCGC2_R;         //  allow time for clock to stabilize
        SYSCTL_RCGC0_R &= ~0X00000300;   // set speed ADC
        ADC0_SSPRI_R = 0X0123;                  // set priority of sequencer
        ADC0_ACTSS_R &= ~0X0008;         // disable sample sequencer 3
        ADC0_EMUX_R &= ~0xF000;                 // set seq3 as software trigger
        ADC0_SSMUX3_R &= ~0x000F;               // clear ss3 field
        ADC0_SSMUX3_R += 1;                             // set channel 7 (PE4)
        ADC0_SSCTL3_R = 0X0006;                 // set flag on sampling
        ADC0_ACTSS_R |= 0X0008;                 // enable sample sequencer 3
}

//------------ADC_In------------
// Busy-wait Analog to digital conversion
// Input: none
// Output: 12-bit result of ADC conversion
unsigned long ADC_In(void)
{
        unsigned long data;
  ADC0_PSSI_R = 0x0008;             // start  - initiate ss3
  while((ADC0_RIS_R&0x08)==0){};     // wait for conversion done
```

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  data = ADC0_SSFIFO3_R&0xFFF;           // read result
  ADC0_ISC_R = 0x0008;                       // acknowledge completion (clear bit)
        return data;                        // return scan value
}



// Initialize any PIN as Output PF2
void PORTF_Init(void)
{
        unsigned long delay;
        SYSCTL_RCGC2_R |= 0x20;            // activate port F clock
        delay = SYSCTL_RCGC2_R;                    // wait for clock to turn on
        GPIO_PORTF_LOCK_R = 0x4c4f434b;     // unlock but not needed
        GPIO_PORTF_CR_R |= 0x4;              // not needed

        GPIO_PORTF_DIR_R |= 0x04;       // Set PF2 as output

        GPIO_PORTF_AMSEL_R &= 0x00;     // Disable analog functionality
        GPIO_PORTF_AFSEL_R &= 0x00;     // disable alt funct on PF2
        GPIO_PORTF_DEN_R  |= 0x04;          // configure PF2 as GPIO

        GPIO_PORTF_PUR_R |= 0X4;
        GPIO_PORTF_PCTL_R |= 0x4;
}
```

```
Error using dbstatus
Error: File: /Users/mosesmccabe/Documents/Embedded System/embedded sys/ADC/adc_m.m Line: 1 Column: 1
Invalid use of operator.
```

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