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/*****
* File:          rtc_sys.c
* Author:        Bryant Gonzaga
* Created:       4/11/2018
* Modified:      4/12/2018
*
* Notes:
*   Intended for ATmega128.
*
* Description:
*   This is a table driven fsm that can set the alarm 0 for an RTC.
*****/

/* Include Libraries */
#include <iom128.h>
#include <intrinsics.h>

/* Include Personal Libraries */
#include "ds1306_rtc_driver.h"
#include "humidicon.h"
#include "fsm_defs.h"
#include "lcd.h"

/* FSM Function in fsm.c */
extern void fsm(state ps, key key_val);

/* MAGIC NUMBER */
#define INIT_MAGIC_NUM 0x3E65

__flash unsigned int* rtc_init_done;

/* Function Prototypes */
void init_rtc_sys();

int main(void)
{
    /* Initialize Ports */
    DDRA = 0x03;      // slave select for rtc and humidicon
    DDRB = 0xFF;      // spi pins
    DDRC = 0xF0;      // for keypad
    DDRD = 0xF0;      // external interrupts

    /* Deselect slaves */
    PORTA &= ~_BV(1);  // deselect rtc
    PORTA |= _BV(0);   // deselect humidicon
    PORTB |= _BV(0);   // deselect lcd

    /* Activate Internal Pullups */
    PORTC = 0x0F;     // for keypad
    PORTD = 0x05;     // for keypad interrupt

    /* Clear the LCD */
    init_lcd_dog();
    clear_dsp();
    update_lcd_dog();
}

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/* Init RTC Chip */
unlock_rtc();
write_rtc(0x8F, 0x04);
lock_rtc();

/* Initialize Interrupts */
EICRA = 0x3C;
EIMSK = 0x07;
__enable_interrupt();

/* Initialize RTC */
init_rtc_sys();      // initialize the time and date

while (1) {
}

}

void init_rtc_sys()
{
    /* check if system has already been initialized */
    if (*rtc_init_done == INIT_MAGIC_NUM) {
        fsm(display_state, rtc_1hz_key);
        return;
    }
    /* Fisrt Power Up Ever */
    fsm(display_state, set_time_key);
    *rtc_init_done = INIT_MAGIC_NUM;
}

```