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/*
 * SCD41_LCD_USART3_Lab11Task1.c
 *
 * Created: 4/26/2022 6:13:25 PM
 * Author : jason
 */

#include <avr/io.h>
#include <math.h>
#define F_CPU 4000000
#include "lcd_dog_AVR128_driver.h"
#include "SCD41_AVR128_driver.h"
#include "USART3_asynch_transmit.h"
#include <util/delay.h>

#define MAX_INPUT_DISPLAY 5

uint16_t CO2;
uint16_t Temp;
uint16_t Rh;

uint16_t baudRate = 9600; //For the baud rate of USART3
uint8_t dataBits = USART_CHSIZE_8BIT_gc; //For the (character size) CHSIZE[2:0]
unsigned char parity = 0x00; //PMODE[1:0]

int main(void)
{
    init_lcd_dog(); //Initialize the buffer of the LCD
    I2C0_SCD41_init(); //Initializes the AVR128DB48 I2C0 to communicate with SCD41

    //Function to initialize the USART3 baud rate, data bit and parity
    USART3_init(baudRate, dataBits, parity);

    while (1)
    {
        SCD41_start_periodic_measurement(I2CSLAVE_ADDR_WRITE, ADDRESS_STARTPERIODIC_MSB, ADDRESS_STARTPERIODIC_LSB);

        //Keep polling until data is ready which can be measured
        while(!SCD41_get_data_ready_status(I2CSLAVE_ADDR_WRITE, ADDRESS_GETDATAREADY_MSB, ADDRESS_GETDATAREADY_LSB));

        SCD41_read_measurement(I2CSLAVE_ADDR_WRITE, ADDRESS_READMEASUR_MSB, ADDRESS_READMEASUR_LSB);

        CO2 = getParseCO2;
        Temp = -45 + ( (175 * getParseTemp) / (pow(2, 16))) );
    }
}
```

```
Rh = 100 * (((float)getParseRh) / (pow(2, 16)));
```

```
//Print the CO2 value into LCD buffer
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sprintf(dsp_buff1, "CO2: %d", CO2);
```

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sprintf(dsp_buff2, "Temp: %d", Temp);
```

```
//Print the humidity value into LCD buffer
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sprintf(dsp_buff3, "Relative Hum: %d", Rh);
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```
//Update the 3 line messages into the LCD buffer
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```
update_lcd_dog();
```

```
//Where it will transmit the entire array of strings to display in TeraTerm or  
Termite
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```
char * inputUSART3DataDisplay[] = {dsp_buff1, " ", dsp_buff2, " ",  
dsp_buff3};
```

```
//Loop through all the strings in the array
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```
for(int i = 0; i < MAX_INPUT_DISPLAY; i++){
```

```
    USART3_sendString(inputUSART3DataDisplay[i]);
```

```
}
```

```
_delay_ms(1000); //Transmit the readings once every 1 second
```

```
}
```

```
}
```