

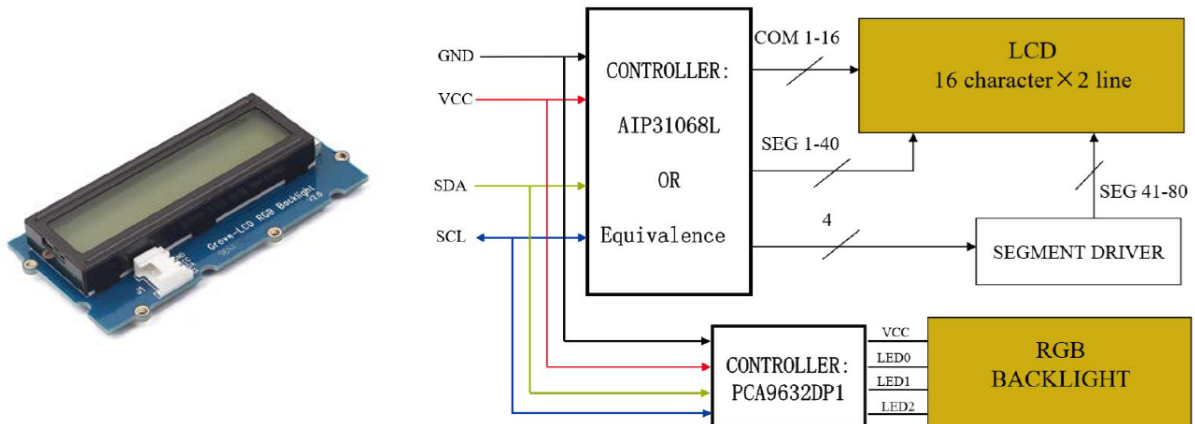
Lab #6

Using I2C to Control an LCD Display

Ver 1.01

Background:

In this lab we will be using a SEED Studio LCD with RGB Backlight:



The AIP31068L LCD Controller is at address 0x3E and the PCA9632DP1 RGB Backlight controller is at address 0x62 (note these are NON SHIFTED addresses).

Using the basic functions provided in example Program18_3.c (and adding at the beginning of the function `i2c_init` the instruction to enable I2C (TWI) in PRR) write a function called `i2c_send1byte` that will take 3 char (8 bit integer) values in (`addr`, `reg`, `value`) and perform the following:

- Call `i2c_start`
- Call `i2c_write` and send the `addr` shifted to the left 1 time (`addr<<1`)
- Call `i2c_write` and send it the register number
- Call `i2c_write` and send it the value to place in the register
- Call `i2c_stop`
- Delay 2 ms

Now replace `main` with a program that will do the following:

- Call `i2c_init`
- Call `i2c_send1byte` multiple times to perform the following tasks
 - Setup RGB Backlight (refer to Data sheet table 7 for addresses)
 - Set `MODE1` register to 0x00
 - Set `LEDOUT` register to 0xFF
 - Set `MODE2` register to 0x20
 - SET `PWM0` register (BLUE Control)
 - SET `PWM1` register (Green Control)

- Set PWM2 register (Red control)
- Setup LCD
 - Setup LCD by writing a 0x38 to register 0x80
 - Turn on LCD, turn off cursor and turn off blink by writing a 0x0C to register 0x80
 - Clear LCD by writing a 0x01 to register 0x80
- Write characters by sending the character to register 0x40 (cursor will automatically move to next space)
- Move to 2nd line of LCD by writing a 0xC0 to register 0x80
- Write characters by sending the character to register 0x40 (cursor will automatically move to next space)