#include <Wire.h>

#include <LiquidCrystal\_I2C.h>

#define ANALOG\_IN\_PIN A0

// Floats for ADC voltage & Input voltage

float adc\_voltage = 0.0;

float in\_voltage = 0.0;

// Floats for resistor values in divider (in ohms)

float R1 = 30000.0;

float R2 = 7500.0;

// Float for Reference Voltage

float ref\_voltage = 5.0;

// Integer for ADC value

int adc\_value = 0;

double Vout = 0;

double Current = 0;

// Constants for Scale Factor

// Use one that matches your version of ACS712

//const double scale\_factor = 0.185; // 5A

const double scale\_factor = 0.1; // 20A

//const double scale\_factor = 0.066; // 30A

// Constants for A/D converter resolution

// Arduino has 10-bit ADC, so 1024 possible values

// Reference voltage is 5V if not using AREF external reference

// Zero point is half of Reference Voltage

const double vRef = 5.00;

const double resConvert = 1024;

double resADC = vRef/resConvert;

double zeroPoint = vRef/2;

LiquidCrystal\_I2C lcd(0x27,16,2); // set the LCD address to 0x27 for a 16 chars and 2 line display

void setup()

{

pinMode(13,OUTPUT);

Serial.begin(9600);

lcd.init(); // initialize the lcd

lcd.init();

lcd.backlight();

lcd.setCursor(0,0);

lcd.print("SMART");

lcd.setCursor(0,1);

lcd.print("ENERGY METER");

delay(1500);

pinMode(9,OUTPUT); //relay

}

void loop()

{

digitalWrite(13,1);

digitalWrite(9,0);//relay

adc\_value = analogRead(ANALOG\_IN\_PIN);

// Determine voltage at ADC input

adc\_voltage = (adc\_value \* ref\_voltage) / 1024.0;

// Calculate voltage at divider input

in\_voltage = adc\_voltage / (R2/(R1+R2));

// Print results to Serial Monitor to 2 decimal places

//Serial.print("Input Voltage = ");

//Serial.println(in\_voltage-7, 2);

// Short delay

delay(500);

for(int i = 0; i < 1000; i++) {

Vout = (Vout + (resADC \* analogRead(A0)));

delay(1);

}

// Get Vout in mv

Vout = Vout/1000;

// Convert Vout into Current using Scale Factor

Current = (Vout - zeroPoint)/ scale\_factor;

// Print Vout and Current to two Current = ");

//Serial.print("Vout = ");

//Serial.print(Vout,2);

//Serial.print(" Volts");

//Serial.print("\t Current = ");

Serial.print(abs(Current),2);

//Serial.println(" Milli Amps");

delay(1000);

if(analogRead(A1)>1000){

lcd.init(); // initialize the lcd

lcd.init();

lcd.backlight();

lcd.setCursor(0,0);

lcd.print("Voltage : 5 V");

lcd.setCursor(0,1);

lcd.print("Current :"+String(abs(Current),2)+"mA");

delay(1500);

}

if(analogRead(A1)>600 && analogRead(A1)<1000){

lcd.init(); // initialize the lcd

lcd.init();

lcd.backlight();

lcd.setCursor(0,0);

lcd.print("Voltage : 3 V");

lcd.setCursor(0,1);

lcd.print("Current :"+String(abs(Current),2)+"mA");

delay(1500);

}

if(analogRead(A1)<600){

lcd.init(); // initialize the lcd

lcd.init();

lcd.backlight();

lcd.setCursor(0,0);

lcd.print("Voltage : 0 V");

lcd.setCursor(0,1);

lcd.print("Current :"+String(abs(Current),2)+"mA");

delay(1500);

}

}