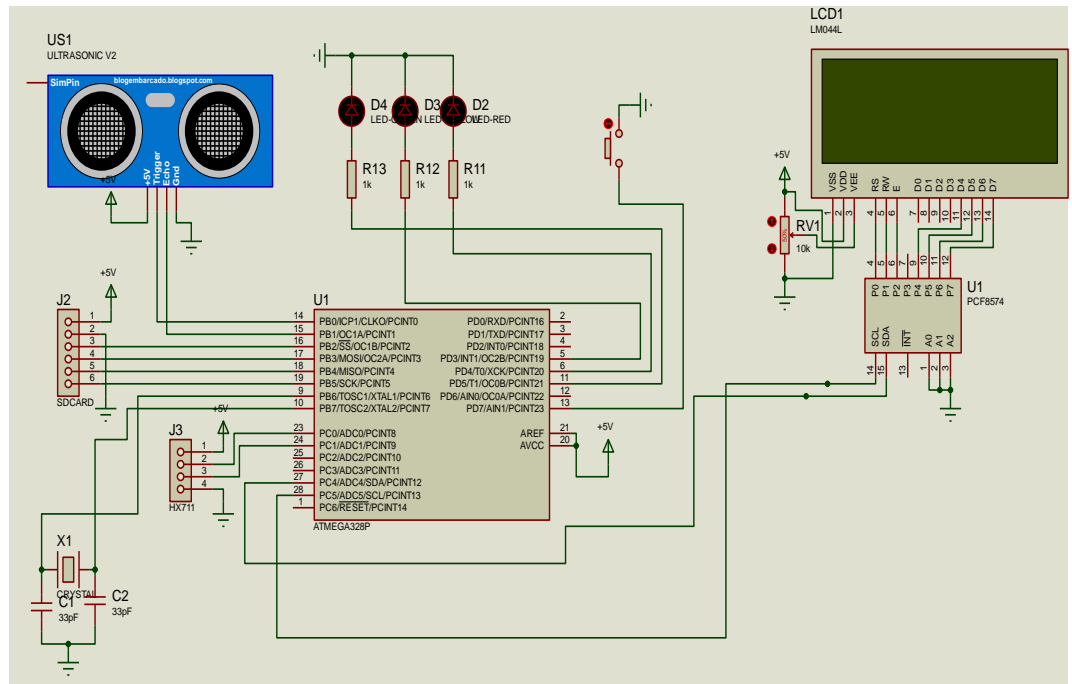
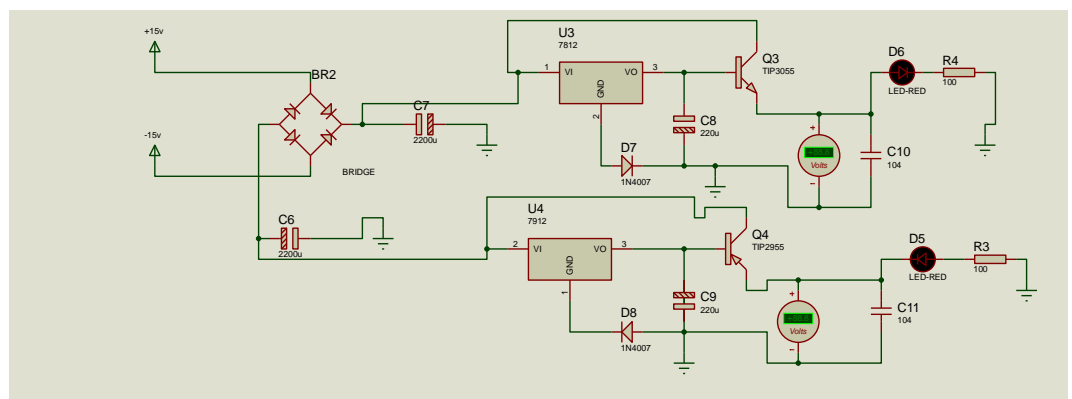


# LAMPIRAN

## 1. Skematik rangkaian



## 2. Skematik Power Supply +- 5 volt



## 3. Program

```
// timer library
#include <TimerOne.h>

// i2c library
#include <Wire.h> //library komunikasi i2c ke lcd
```

```
// lcd library
#include <LiquidCrystal_I2C.h>

// GY-906 library
#include <Adafruit_MLX90614.h>
Adafruit_MLX90614 mlx = Adafruit_MLX90614();

// Set the LCD address to 0x27 for a 16 chars and 4 line
display

LiquidCrystal_I2C lcd(0x3F, 16, 4);

#include <SPI.h>
#include <SD.h>

// hx711 library
#include "HX711.h"
// hx711 konfig
HX711 scale(A1, A0);

// pendefinisian pin / nama alias
#define echo      9
#define triger    8
#define button    7
#define led_R     4
#define led_Y     3
#define led_G     5
#define buzzer    6

// mosi 11, miso 12, sck 13, cs 10
#define cs        10
#define sensordenyut 2

// variable
int tinggi;
float berat;
float bmi;
float suhu;
int denyut;
int timer=0,time=10;
```

```

int counter=0;
int str=0;
int nomor=1;

File myFile;
void led(byte h)
{
  switch (h)
  {
    case 0: digitalWrite(led_R,HIGH);digitalWrite(led_Y,LOW);
    digitalWrite(led_G,LOW);break;
    case 1: digitalWrite(led_R,LOW);digitalWrite(led_Y,HIGH);
    digitalWrite(led_G,LOW);break;
    case 2: digitalWrite(led_R,LOW);digitalWrite(led_Y,LOW);
    digitalWrite(led_G,HIGH);break;
    case 3: digitalWrite(led_R,LOW);digitalWrite(led_Y,LOW);
    digitalWrite(led_G,LOW);break;
  }
  long int cnt_dnyt[20];
  // timer
  void timerIsr()
  {
    if(str==1)timer++;
  }
  // counter
  void extIsr()
  {
    if(str==1&&timer<time)
    {
      counter++;
      cnt_dnyt[counter]=millis();
    }
  }
}

```

```
float hitung_denyut(int cnt){
int i;
long int jml=0;
float ret=0;

if (cnt>5)
{
// for (i=cnt;i>1;i--)
{
jml=(cnt_dnyt[cnt]-cnt_dnyt[cnt-1]);
}
ret=60000.0/(float)jml ;
}
else ret= 0;
return ret;
}

// fungsi setup
void setup()
{
// port serial terbuka
Serial.begin(9600);
mlx.begin();
delay(500);
lcd.init(); // lcd inisialisasi
lcd.backlight();
// gy-906 inisialisasi
// pengaturan pin
pinMode(triger, OUTPUT);
pinMode(led_R, OUTPUT);
pinMode(led_Y, OUTPUT);
pinMode(led_G, OUTPUT);
pinMode(buzzer, OUTPUT);
```

```

    pinMode(echo, INPUT);
    pinMode(button, INPUT_PULLUP);
    led(0);
    pinMode(cs, OUTPUT);
    digitalWrite (buzzer,HIGH);
    if (!SD.begin(10))
    {
        lcd.clear();
        lcd.print("MicroSD Error!");
        delay(1000);
    }
    Else
    {
        lcd.clear();
        lcd.print("MicroSD OK!");
        delay(1000);
    }
    Timer1.initialize(1000000); // interval 1000000 = 1 detik
    Timer1.attachInterrupt( timerIsr ); // attach the service
    routine here
    attachInterrupt (digitalPinToInterrupt(sensordenyut),
    extIsr, RISING);
    digitalWrite (buzzer,LOW);
    lcd.clear();
    lcd.setCursor(0,0);
    lcd.print("  Welcome To  ");
    lcd.setCursor(0,1);
    lcd.print("Medical Healthy ");
    lcd.setCursor(-4,2);
    lcd.print("  Detection  ");
    lcd.setCursor(-4,3);
    lcd.print("=====");
    delay(5000);

```

```

    nomor=0;
}

void cek_objek()
{
    led(0);
    while(1){
        int ultra = read_ultra();
        suhu = mlx.readObjectTempC();
        denyut = counter;
        if(ultra>200)ultra=200;
        tinggi=200-ultra;
        // baca berat
        berat=baca_loadcell();
        if(berat<0)berat=0;
    }
    led(1);
}

// fungsi baca sensor ultrasonik
float read_ultra()
{
    float mydistance; // lokal variable
    // suara ultrasonik on
    digitalWrite(triger, HIGH);
    // jeda
    delayMicroseconds(50);
    // suara ultrasonik off
    digitalWrite(triger, LOW);
    // baca pulsa dan konvert ke cm
    mydistance=(float)pulseIn(echo,1)/58;
    // nilai balik
    return mydistance;
}

```

```

}

// membaca loadcell

float baca_loadcell(){

  float berat_tim=((scale.read()/1000-0)* 0.0515 - 4.8666)-
1.3;

  if (berat_tim<2){berat_tim=0;}

  return berat_tim
}

//void coba_load()

{

// lcd.clear();
// lcd.setCursor(0,0);
// lcd.print(((scale.read()/1000)* 0.0515 - 3.215),1);
// delay(500);
}

//pengujian sensor

void test_sensor()

{

Serial.print("LOAD: ");
Serial.print(baca_loadcell());
Serial.print("  DISTANCE: ");
Serial.print(read_ultra());
Serial.print("  SUHU: ");
Serial.println(mlx.readObjectTempC());
}

// kalibrasi timbangan

void kalibrasi()

{

// berat=baca_loadcell()*maxkg/adcmx;
  lcd.clear();
  lcd.setCursor(0,0);

```

```
    lcd.print(baca_loadcell());
    lcd.setCursor(0,1);
    lcd.print(berat);
    delay(100);
}

// program keseluruhan
void loop()
{
    lcd.clear();
    while (digitalRead(button)==1) {
        led(0);
        lcd.setCursor(0,0);
        lcd.print("1.Pasang Finger ");
        lcd.setCursor(0,1);
        lcd.print("2.Berdiri dg Bnr");
        lcd.setCursor(-4,2);
        lcd.print("3.Atur Sens Suhu");
        lcd.setCursor(-4,3);
        lcd.print("4.Tekan Start  ");
        delay(100);
    }

    delay(1000);
    //Serial.println(baca_loadcell());
    //Serial.println(read_ultra());
    //test_sensor();
    led(1);
    timer=0;
    counter=0;
    str=1;
    while (timer<10)
    {
        lcd.setCursor(0,0);
```



```

    lcd.print ("===Pengukuran===");
    lcd.setCursor (0,1);
    lcd.print (tinggi,1);
    lcd.print ("Cm");
    lcd.setCursor (8,1);
    lcd.print (berat,1);
    lcd.print ("Kg");
    lcd.setCursor (-4,2);
    lcd.print ("Suhu:");
    lcd.print (suhu,1);
    lcd.write (0xdf);
    lcd.print ("C");
    lcd.setCursor (-4,3);
    lcd.print ("BPM:");
    lcd.print (denyut);
    delay (200);
}

float tinggim=(float)tinggi/100;
float tinggibmi=(float)tinggim*tinggim;
bmi=(float)berat/tinggibmi;
float cek_berat=baca_loadcell();
    led(2);
    while(cek_berat>10)
{
    lcd.clear();
    lcd.setCursor (0,0);
    lcd.print ("=====HASIL=====");
    lcd.setCursor (0,1);
    lcd.print (tinggi,1);
    lcd.print ("Cm");
    lcd.setCursor (8,1);
    lcd.print (berat,1);

```

```

lcd.print("Kg");
lcd.setCursor(-4,2);
lcd.print("Suhu:");
lcd.print(suhu,1);
lcd.write(0xdf);
lcd.print("C");
lcd.setCursor(-4,3);
lcd.print("BPM:");
lcd.print(denyut);
delay(2000);

lcd.clear();
lcd.setCursor(0,0);
lcd.print("====HASIL====");
lcd.setCursor(0,1);
lcd.print("BMI:");
lcd.print(bmi,1);
lcd.print(" ");
if (bmi<17.0) {lcd.print("SKurus");}
if (bmi>17.0&&bmi<=18.5) {lcd.print("Kurus");}
if (bmi>18.5&&bmi<=25.0) {lcd.print("Normal");}
if (bmi>25.0&&bmi<=27.0) {lcd.print("Gemuk");}
if (bmi>27.0) {lcd.print("SGemuk");}
lcd.setCursor(-4,2);
if (denyut<60){
    lcd.print("Bradycardia");}
else if (denyut>59&&denyut<100)
{
    lcd.print("Denyut Normal");
}
else if (denyut>100){
    lcd.print("Tacycardia");}

```

```

lcd.setCursor(-4,3);
if (suhu<36.5){
lcd.print("Hipothermia");}
else if (suhu>36.4&&su<37.6){
lcd.print("Suhu Normal");
}
else if (suhu>37.5&&su<40.0){
lcd.print("Demam ");
}
else if (suhu>40.0)
{
lcd.print("Hyperthermia");
//led(0);
digitalWrite(led_R,HIGH);
}
delay(2000);
digitalWrite(led_R,LOW);
cek_berat=baca_loadcell();
}

myFile = SD.open("LOG.TXT", FILE_WRITE); //
buat file

// jika file terbuka
if (myFile) {
myFile.print("----- ");
myFile.print(nomor);
myFile.println(" -----");

myFile.print("Tinggi: ");
myFile.print(tinggi,1);
myFile.println(" Cm");
}

```

```
myFile.print("Berat: ");
myFile.print(berat,1);
myFile.println(" Kg");

myFile.print("BMI: ");
myFile.print(bmi,1);
myFile.print(" ");
if(bmi<17.0){myFile.println("Sangat Kurus");}
if(bmi>17.0&&bmi<=18.5){myFile.println("Kurus");}
if(bmi>18.5&&bmi<=25.0){myFile.println("Normal");}
if(bmi>25.0&&bmi<=27.0){myFile.println("Gemuk");}
if(bmi>27.0){myFile.println("Sangat Gemuk");}

myFile.print("Suhu: ");
myFile.print(suhu,1);
myFile.println(" C");
if (suhu<36.5){
    myFile.println("Hipothermia");}
else if (suhu>36.4&&suhu<37.6){
    myFile.println("Suhu Normal");
}
else if (suhu>37.5&&suhu<40.0){
    myFile.println("Demam ");
}
else if (suhu>40.0){
    myFile.println("Hyperthermia");
}

myFile.print("BPM: ");
myFile.println(denyut);
```

```
        if (denyut<60){
            myFile.println("Bradycardia");}
        else if (denyut>59&&denyut<100){
            myFile.println("Denyut Normal");
        }
        else if (denyut>100)
    {
        myFile.println("Tacycardia");
    }

    myFile.close();
    lcd.clear();
    lcd.setCursor(0,0);
    lcd.print("Save To MicroSD");
    delay(1000);
    str=0;
    timer=0;
    counter=0;
    nomor++;
}}
```