LAMPIRAN 1

Coding

```
//Coding Smart Trash Bin V1
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//Deklarasi Library
#include <Wire.h>
#include <LiquidCrystal_I2C.h>
#include <Servo.h>
#include <DHT.h>;
#include <SoftwareSerial.h>

//Definisi pin untuk gsm modul sim800l
SoftwareSerial SIM800L (52,53);// RX | TX
// Connect the SIM800L TX to Arduino pin 52 RX.
// Connect the SIM800L RX to Arduino pin 53 TX.

//Sensor DHT22 untuk sampah basah
#define DHTPIN 2  //pin yang digunakan
#define DHTTYPE DHT22   //DHT22 (AM2302)
DHT dht(DHTPIN, DHTTYPE); //Inisialisasi DHT sensor untuk normal 16mhz
Arduino

//Sensor Infrared
#define digitalInPin1 3 //IR NON LOGAM
#define digitalInPin2 4 //IR KERING

//Sensor ultrasonik untuk kepenuhan
#define trigPinlogam 5 //Kepenuhan Tray Sampah logam
#define echoPinlogam 6 //Kepenuhan Tray Sampah logam
#define trigPinbasah 7 //Kepenuhan Tray Sampah basah
#define echoPinbasah 8 //Kepenuhan Tray Sampah basash
#define trigPinkering 9 //Kepenuhan Tray Sampah kering
#define echoPinkering 10 //Kepenuhan Tray Sampah kering

//variabel GSM
int normalDistance;
boolean triggeredlogam = false;
boolean triggeredbasah = false;
boolean triggeredkering = false;
```

```
long durationlogam, distancelogam, durationbasah, distancebasah, durationkering,
distancekering;

//variabel sensor IR
   int sensorValue1 = 0;
   int sensorValue2 = 0;

//variabel sensor DHT22
   int chk;
   float hum;  //Stores humidity value
   float temp; //Stores temperature value

//variabel sensor logam
   int inputPin = 13;
   int val = 0;

//Deklarasi LCD + i2C
   LiquidCrystal_I2C lcd(0x3F, 2, 1, 0, 4, 5, 6, 7, 3, POSITIVE);

//Pin buzzer
   int piezoPin = 22;

//Pin Led jenis Sampah
int ledlogam = 14;
int ledbasah = 15;
int ledkering = 16;

// Deklarasi servo
   Servo servo1;
   Servo servo2;

//gsm
boolean triggered = false;

void setup() {
   pinMode(inputPin, INPUT); //sensor logam
   Wire.begin();
   lcd.begin(16, 2);
   lcd.clear();            //clear lcd
   delay(1000);
   Serial.begin(9600);
   delay(100);
```

```
    // start th serial communication with the host computer
    //Serial.begin(9600);
    while(!Serial);
    Serial.println("Arduino with SIM800L is ready");

    // start communication with the SIM800L in 9600
    SIM800L.begin(115200);
    Serial.println("SIM800L started at 115200");
    delay(1000);
    Serial.println("Setup Complete! SIM800L is Ready!");


    dht.begin();              //sensor dht
    pinMode(24, INPUT);       //sensor basah
    pinMode(23, OUTPUT);      //buzzer hitam
    pinMode(30, OUTPUT);      //led penuh logam
    pinMode(31, OUTPUT);      //led penuh basah
    pinMode(32, OUTPUT);      //led penuh kering
    pinMode(ledlogam, OUTPUT); //led logam
    pinMode(ledbasah, OUTPUT); //led basah
    pinMode(ledkering, OUTPUT); //led kering

//Inisialisasi sensor Ultrasonik
    pinMode(trigPinlogam, OUTPUT);
    pinMode(echoPinlogam, INPUT);
    pinMode(trigPinbasah, OUTPUT);
    pinMode(echoPinbasah, INPUT);
    pinMode(trigPinkering, OUTPUT);
    pinMode(echoPinkering, INPUT);

long durationlogam, distancelogam, durationbasah, distancebasah, durationkering,
distancekering;

while (millis()<5000){
digitalWrite(trigPinlogam, LOW);
delayMicroseconds(2);
digitalWrite(trigPinlogam, HIGH);
delayMicroseconds(10);
digitalWrite(trigPinlogam, LOW);
durationlogam = pulseIn(echoPinlogam, HIGH);
distancelogam= durationlogam*0.034/2;
normalDistance = distancelogam;
Serial.print("Distance logam : ");
Serial.println(distancelogam);
```

```
digitalWrite(trigPinbasah, LOW);
delayMicroseconds(2);
digitalWrite(trigPinbasah, HIGH);
delayMicroseconds(10);
digitalWrite(trigPinbasah, LOW);
durationbasah = pulseIn(echoPinbasah, HIGH);
distancebasah = durationbasah*0.034/2;
normalDistance = distancebasah;
Serial.print("Distance basah: ");
Serial.println(distancebasah);

digitalWrite(trigPinkering, LOW);
delayMicroseconds(2);
digitalWrite(trigPinkering, HIGH);
delayMicroseconds(10);
digitalWrite(trigPinkering, LOW);
durationkering = pulseIn(echoPinkering, HIGH);
distancekering = durationkering*0.034/2;
normalDistance = distancekering;
Serial.print("Distance kering: ");
Serial.println(distancekering);

}

//Pin servo
   servo1.attach(11);
   servo2.attach(12);

            }

void loop() {

//led sampah
digitalWrite(ledlogam, HIGH);
digitalWrite(ledbasah, HIGH);
digitalWrite(ledkering, HIGH);


//membaca data sensor Inframerah menyimpannya ke variabel sensorValue.
   sensorValue1 = digitalRead(digitalInPin1);
   sensorValue2 = digitalRead(digitalInPin2);

//membaca data dan menyimpannya ke variabel hum dan temp.
```

```
    hum = dht.readHumidity();
    temp= dht.readTemperature();

//menampilkan nilai kelembaban dan temperatur, ke serial monitor.
    Serial.print("\n\n___Smart Trashbin V.1___");
    Serial.print("\n\nMonitoring....");
    Serial.print("\nHumidity: ");
    Serial.print(hum);
    Serial.print(" %, Temp: ");
    Serial.print(temp);
    Serial.println(" Celsius");
    delay(1000); //Delay 2 detik.

//Menu utama
lcd.clear();
lcd.clear();
lcd.setCursor(0,0);
lcd.print(" SMART TRASHBIN ");
lcd.setCursor(0,1);
lcd.print(" STB-01| ");
lcd.print(hum);

//ERROR
  if(sensorValue1 == 0 && sensorValue2 == 0){ //checks if object is there or not
    Serial.println("\nSTB ERROR");

  Serial.println("Set format SMS ke ASCII");
  SIM800L.write("AT+CMGF=1\r\n");
  delay(1000);

  Serial.println("SIM800L Set SMS ke Nomor Tujuan");
  SIM800L.write("AT+CMGS=\"082139932041\"\r\n");
  delay(1000);

  Serial.println("SIM800L Send SMS content");
  SIM800L.write("TEMPAT SAMPAH ERROR BOS, SEGERA DI CEK, TRUS
LANJUTIN NGOPI LAGI");
  delay(1000);

  Serial.println("Mengirim Char Ctrl+Z / ESC untuk keluar dari menu SMS");
  SIM800L.write((char)26);
  delay(1000);

    lcd.clear();
```

```
   lcd.setCursor(0,0);
   lcd.print("STB ERROR");
   lcd.setCursor(0,1);
   lcd.print("HUBUNGI PETUGAS");
   Serial.print("\nTEMPAT SAMPAH EROR BOS");
   Serial.print("\nKIRIM SMS KE PETUGAS");
   digitalWrite(23, HIGH);
   delay(1000);
   exit(0);
   }
   else {
     digitalWrite(23, LOW);
     delay(1000);
     }

     //Sensor logam membaca data, jika status HIGH maka servo kembali ke posisi
awal.
     val = digitalRead(inputPin);
     Serial.print("sensor logam = ");
     Serial.print(val);
     if (val == HIGH){
     servo1.write(55);
     delay(1000);
     }
     //Sensor logam membaca data, menggerakkan servo1 ke kanan, menampilkan
pesan lcd dan membunyikan buzzer.
     else {
       Serial.println(val);
       lcd.clear();
       lcd.setCursor(0,0);
       lcd.print("SAMPAH LOGAM");
       lcd.setCursor(0,1);
       lcd.print("METAL TRASH");
       Serial.println("SAMPAH LOGAM");
       digitalWrite(ledlogam, HIGH);
       delay(1000);
       digitalWrite(ledlogam, LOW);
       delay(1000);
       tone(piezoPin, 500, 500);
       servo1.write(-120);
       Serial.println("servologam");
       delay(1000);
          }
//Sampah non logam
```

```
  Serial.print("\nsensor1 = ");
  Serial.print(sensorValue1);

  if(sensorValue1 == 0){ //checks if object is there or not
    Serial.print("\nBenda nonlogam terdeteksi");
    servo1.write(120);
    delay(500);
    }
    else{
    servo1.write(50);
    //delayMicroseconds(20);
    Serial.print("\nBenda nonlogam tidak terdeteksi");
    delay(500);
    }

//Sampah Basah
      //Jika Kondisi sensor LOW .... , maka servo2 akan bergerak ke kanan dan lcd
menampilkan pesan, buzzer berbunyi.
      if (digitalRead(24) == LOW){
          servo2.write(-120);
          lcd.clear();
          lcd.setCursor(0,0);
          lcd.print("SAMPAH BASAH");
          lcd.setCursor(0,1);
          lcd.print("WET TRASH");
          Serial.print("\nSampah basah terdeteksi");
          digitalWrite(ledbasah, LOW);
          delay(1000);
          digitalWrite(ledbasah, HIGH);
          delay(1000);
          tone(piezoPin, 1000, 500);
          delay(2000);
                    }
         //Jika Kondisi sensor HIGH .... , maka servo2 akan bergerak ke posisi awal dan
kembali ke Menu utama.
         else if (digitalRead(24) == HIGH){
             servo2.write(40);
             delay(5000);
          }

//Sampah Kering
Serial.print("\nsensor2 = ");
Serial.print(sensorValue2);
```

```
    //Jika Sensor IR bernilai 0, maka servo2 akan bergerak ke kiri, dan lcd
menampilkan pesan, buzzer berbunyi.
    if(sensorValue2 == 0){ //cek jika obyek ada atau tidak.
    Serial.print("\nSampah kering terdeteksi");
    digitalWrite(ledbasah, LOW);
    delay(1000);
    digitalWrite(ledbasah, HIGH);
    delay(1000);
    servo2.write(120);
    lcd.clear();
    lcd.setCursor(0,0);
    lcd.print("SAMPAH KERING");
    lcd.setCursor(0,1);
    lcd.print("DRY TRASH");
    tone(piezoPin, 2000, 500);
    delay(2000);
                    }
    //Jika benda tidak terdeteksi maka servo kembali ke posisi awal.
    else{
    servo2.write(40);
    delay(1000);
     Serial.print("\nSampah kering tidak terdeteksi");
       }

//ultragsmlogam
digitalWrite(trigPinlogam, LOW);
delayMicroseconds(2);
digitalWrite(trigPinlogam, HIGH);
delayMicroseconds(10);

digitalWrite(trigPinlogam, LOW);
durationlogam = pulseIn(echoPinlogam, HIGH);
distancelogam = durationlogam*0.034/2;
Serial.print("\n\nDistance logam: ");
Serial.println(distancelogam);

//ultragsmbasah
digitalWrite(trigPinbasah, LOW);
delayMicroseconds(2);
digitalWrite(trigPinbasah, HIGH);
delayMicroseconds(10);

digitalWrite(trigPinbasah, LOW);
durationbasah = pulseIn(echoPinbasah, HIGH);
```

```
distancebasah = durationbasah*0.034/2;
Serial.print("Distance basah: ");
Serial.println(distancebasah);

//ultragsmkering
digitalWrite(trigPinkering, LOW);
delayMicroseconds(2);
digitalWrite(trigPinkering, HIGH);
delayMicroseconds(10);

digitalWrite(trigPinkering, LOW);
durationkering = pulseIn(echoPinkering, HIGH);
distancekering = durationkering*0.034/2;
Serial.print("Distance kering: ");
Serial.println(distancekering);

if (distancelogam <= 29)
{
triggeredlogam = true;
}
else
{
triggeredlogam = false;
}
if (triggeredlogam)
{

 Serial.println("Set format SMS ke ASCII");
  SIM800L.write("AT+CMGF=1\r\n");
  delay(1000);

  Serial.println("SIM800L Set SMS ke Nomor Tujuan");
  SIM800L.write("AT+CMGS=\"082139932041\"\r\n");
  delay(1000);

  Serial.println("SIM800L Send SMS content");
  SIM800L.write("SAMPAH LOGAM PENUH BOS, SEGERA AMBIL, TRUS
LANJUTIN NGOPI LAGI");
  delay(1000);

  Serial.println("Mengirim Char Ctrl+Z / ESC untuk keluar dari menu SMS");
  SIM800L.write((char)26);
  delay(1000);
```

```
    lcd.clear();
    lcd.setCursor(0,0);
    lcd.print("LOGAM PENUH");
    lcd.setCursor(0,1);
    lcd.print("HUBUNGI PETUGAS");
    digitalWrite(23, HIGH);
    Serial.print("\nSAMPAH LOGAM PENUH");
    Serial.print("\nKIRIM SMS KE PETUGAS");
    digitalWrite(30, HIGH);       // led penuh logam nyala
    delay(1000);
    exit(0);
}

if (distancebasah <= 30)
{
triggeredbasah = true;
}
else
{
triggeredbasah = false;
}
if (triggeredbasah)
{

  Serial.println("Set format SMS ke ASCII");
  SIM800L.write("AT+CMGF=1\r\n");
  delay(1000);

  Serial.println("SIM800L Set SMS ke Nomor Tujuan");
  SIM800L.write("AT+CMGS=\"082139932041\"\r\n");
  delay(1000);

  Serial.println("SIM800L Send SMS content");
  SIM800L.write("SAMPAH BASAH PENUH BOS, SEGERA AMBIL, TRUS
LANJUTIN NGOPI LAGI");
  delay(1000);

  Serial.println("Mengirim Char Ctrl+Z / ESC untuk keluar dari menu SMS");
  SIM800L.write((char)26);
  delay(1000);

    lcd.clear();
    lcd.setCursor(0,0);
    lcd.print("BASAH PENUH");
```

```
    lcd.setCursor(0,1);
    lcd.print("HUBUNGI PETUGAS");
    digitalWrite(23, HIGH);
    Serial.print("\nSAMPAH BASAH PENUH");
    Serial.print("\nKIRIM SMS KE PETUGAS");
    digitalWrite(31, HIGH);       // led penuh basah nyala
    delay(1000);
    exit(0);

}

if (distancekering <= 25)
{
triggeredkering = true;
}
else
{
triggeredkering = false;
}
if (triggeredkering)
{

  Serial.println("Set format SMS ke ASCII");
  SIM800L.write("AT+CMGF=1\r\n");
  delay(1000);

  Serial.println("SIM800L Set SMS ke Nomor Tujuan");
  SIM800L.write("AT+CMGS=\"082139932041\"\r\n");
  delay(1000);

  Serial.println("SIM800L Send SMS content");
  SIM800L.write("SAMPAH KERING PENUH BOS, SEGERA AMBIL, TRUS
LANJUTIN NGOPI LAGI");
  delay(1000);

  Serial.println("Mengirim Char Ctrl+Z / ESC untuk keluar dari menu SMS");
  SIM800L.write((char)26);
  delay(1000);

    lcd.clear();
    lcd.setCursor(0,0);
    lcd.print("KERING PENUH");
    lcd.setCursor(0,1);
    lcd.print("HUBUNGI PETUGAS");
```

```
    digitalWrite(23, HIGH);
    Serial.print("\nSAMPAH KERING PENUH");
    Serial.print("\nKIRIM SMS KE PETUGAS");
    digitalWrite(32, HIGH);       // led penuh kering nyala
    delay(1000);
    exit(0);
}

}
```

LAMPIRAN 2

Foto alat

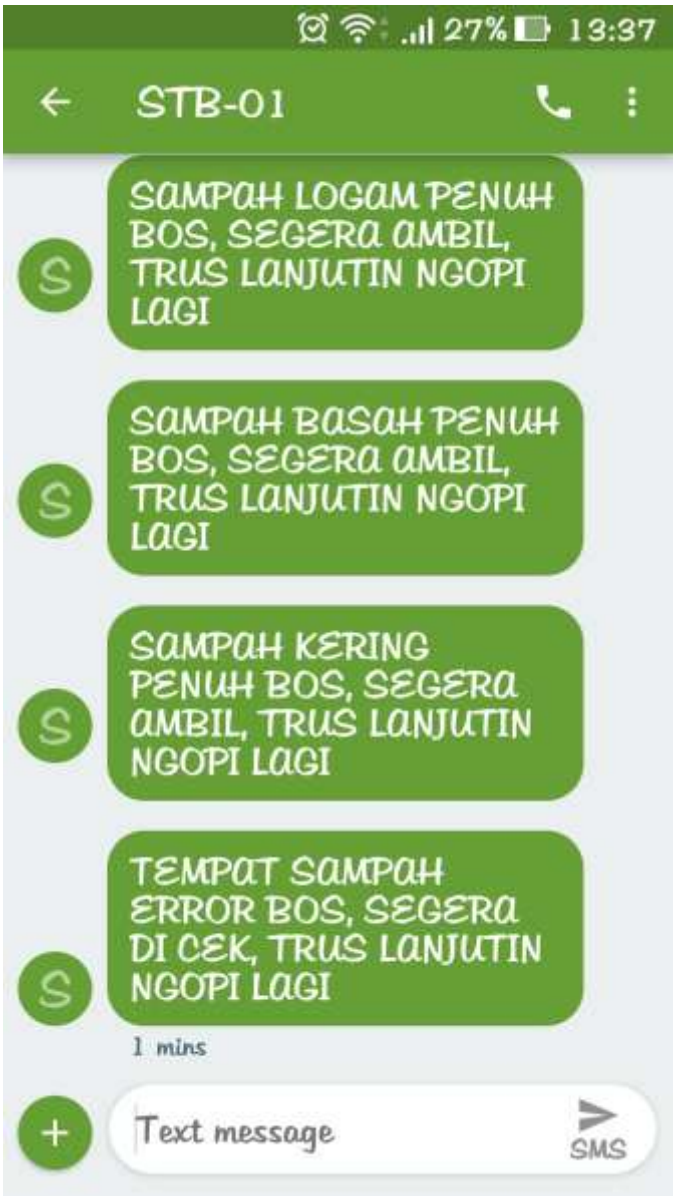
STB Tampak atas

Penampung sampah logam, sampah basah, sampah kering

STB-01

STB Tampak Belakang

STB Tampak Belakang Terbuka



Notifikasi Apabila Penampung penuh, sesuai jenis sampah dan jika sampah mengalami ERROR.

"HALAMAN INI SENGAJA DIKOSONGKAN"