

LAMPIRAN

LAMPIRAN A

Listing Program Modifikasi

Listing Program Modifikasi Tempat Sampah Otomatis Dengan *Monitoring* Kapasitas Sampah Dan Lokasi Tempat Sampah Menggunakan *Smartphone* Berbasis *Internet Of Things*

```
#include <WiFi.h>
#include <TinyGPS++.h>
#include <SoftwareSerial.h>
#include <Servo.h>
#include <Wire.h>
#include <LiquidCrystal_I2C.h>
#include <DFPlayer_Mini_Mp3.h>
#include <FirebaseESP32.h>
#include <addons/TokenHelper.h>
#include <addons/RTDBHelper.h>

#define WIFI_SSID "p"
#define WIFI_PASSWORD "qwertyuiop"
#define API_KEY
"AIzaSyD1XFv135B6V2U81bAPXHhbrC7RixfqNDs"
#define DATABASE_URL "smart-trash-4fc1c-default-
rtdb.firebaseio.com" //<databaseName>.firebaseio.com or
<databaseName>.<region>.firebaseio.com
#define USER_EMAIL "smarttrash2022@gmail.com"
#define USER_PASSWORD "smarttrashpnc2022"

float latitude , longitude;
String lat_
str = "0", lng_str = "0";
int kap;
int pos = 0;
int echoPin1 = 19;
int initPin1 = 23;
int distance1 = 0;int echoPin2 = 32; //32
```

```

int initPin2 = 33; //33
int distance2 = 0;
long proveus;
String ID = "3";
bool en;

Servo myservo;
TinyGPSPlus gps;
SoftwareSerial SerialGPS;
SoftwareSerial dfplayer;
LiquidCrystal_I2C lcd(0x27, 16, 2);
FirebaseData fbdo;
FirebaseAuth auth;
FirebaseConfig config;

void setup() {
  Serial.begin(115200);
  lcd.init();
  lcd.backlight();
  SerialGPS.begin(9600, SWSERIAL_8N1, 17, 16, false);
  dfplayer.begin(9600, SWSERIAL_8N1, 26, 27, false);
  mp3_set_serial(dfplayer);
  delay(5);
  mp3_set_volume(15);
  delay(100);
  myservo.attach(25);
  pinMode(initPin1, OUTPUT);
  pinMode(echoPin1, INPUT);
  pinMode(initPin2, OUTPUT);
  pinMode(echoPin2, INPUT);
  lcd.clear();
  servo_tutup;

  WiFi.begin(WIFI_SSID, WIFI_PASSWORD);
  Serial.print("Connecting to Wi-Fi");
  lcd.setCursor(0, 0);
  lcd.print("Connecting to");
  lcd.setCursor(0, 1);
  lcd.print("Wifi");

```

```

while (WiFi.status() != WL_CONNECTED)
{
  lcd.setCursor(5, 1);
  lcd.print(">");
  Serial.print(".");
  delay(300);
  lcd.setCursor(5, 1);
  lcd.print(" ");
  delay(300);
}
lcd.clear();
lcd.setCursor(0, 0);
lcd.print("Wifi Connected");
Serial.println();
Serial.print("Connected with IP: ");
Serial.println(WiFi.localIP());
Serial.println();
Serial.printf("Firebase           Client           v%s\n\n",
FIREBASE_CLIENT_VERSION);
delay(1000);
lcd.clear();
lcd.setCursor(0, 0);
lcd.print("Connecting to");
lcd.setCursor(0, 1);
lcd.print("Firebase");
config.api_key = API_KEY;
auth.user.email = USER_EMAIL;
auth.user.password = USER_PASSWORD;
config.database_url = DATABASE_URL;
config.token_status_callback = tokenStatusCallback; //see
addons/TokenHelper.h
Firebase.begin(&config, &auth);
Firebase.reconnectWiFi(true);
lcd.clear();
lcd.setCursor(0, 0);
lcd.print("Firebase OK");
delay(1000);
lcd.clear();
}

```

```

void loop() {
  if (kap < 90) {
    if ((millis() - proveus) > 1000) {
      readultra();
      if (distance2 < 35) {
        delay(1000);
        if (distance2 < 35) {
          en = 1;
          servo_buka();
        }
      }
    }
    else {
      delay(1000);
      read_gps();
      servo_tutup();
      if (en == 1) {
        mp3_play (1);
        delay(1000);
        en = 0;
      }
      Serial.printf("Set string... %s\n", Firebase.setString(fbdo,
F("/status3"), "0") ? "ok" : fbdo.errorReason().c_str());
      Serial.printf("Set string... %s\n", Firebase.setString(fbdo,
F("/kapasitas3"), String(kap)) ? "ok" : fbdo.errorReason().c_str());
      Serial.printf("Set string... %s\n", Firebase.setString(fbdo,
F("/lat3"), String(lat_str)) ? "ok" : fbdo.errorReason().c_str());
      Serial.printf("Set string... %s\n", Firebase.setString(fbdo,
F("/long3"), String(lng_str)) ? "ok" : fbdo.errorReason().c_str());
      proveus = millis();
    }
  }
  else {
    read_gps();
  }
}
else {
  if ((millis() - proveus) > 1000) {
    readultra();
    if (distance2 < 35) {

```

```

delay(1000);
if (distance2 < 35) {
  if (en == 1) {
    servo_tutup();
    mp3_play (2);
    delay(1000);
    en = 0;
  }
}
else {
  en = 1;
  Serial.printf("Set string... %s\n", Firebase.setString(fbdo,
F("/status3"), "1") ? "ok" : fbdo.errorReason().c_str());
  Serial.printf("Set string... %s\n", Firebase.setString(fbdo,
F("/kapasitas3"), String(kap)) ? "ok" : fbdo.errorReason().c_str());
  Serial.printf("Set string... %s\n", Firebase.setString(fbdo,
F("/lat3"), String(lat_str)) ? "ok" : fbdo.errorReason().c_str());
  Serial.printf("Set string... %s\n", Firebase.setString(fbdo,
F("/long3"), String(lng_str)) ? "ok" : fbdo.errorReason().c_str());
  proveus = millis();
}
}
else {
  read_gps();
}
}

read_gps();
lcd.setCursor(0, 0);
lcd.print("ID: " + ID);
}

void servo_buka() {
myservo.write(70);
}

void servo_tutup() {
myservo.write(180);
}

```

```

}

void readultra() {
    distance1 = getDistance(initPin1, echoPin1);
    delay(150);

    distance2 = getDistance(initPin2, echoPin2);
    delay(150);

    printDistance(1, distance1);
    printDistance(2, distance2);
    Serial.println("");

    kap = map(distance1, 43, 8, 0, 100);
    if (kap > 100) {
        kap = 100;
    }
    else if (kap < 0) {
        kap = 0;
    }
    lcd.setCursor(0, 1);
    lcd.print("Kapasitas: " + String(kap, DEC) + "% ");
}

void read_gps() {
    if (SerialGPS.available() > 0) {
        if (gps.encode(SerialGPS.read()))
        {
            if (gps.location.isValid())
            {
                latitude = gps.location.lat();
                lat_str = String(latitude , 6);
                longitude = gps.location.lng();
                lng_str = String(longitude , 6);
                Serial.print("Latitude = ");
                Serial.println(lat_str);
                Serial.print("Longitude = ");
                Serial.println(lng_str);
            }
        }
    }
}

```

```

        Serial.println();
    }
}
}

int getDistance (int initPin, int echoPin) {
    digitalWrite(initPin, HIGH);
    delayMicroseconds(10);
    digitalWrite(initPin, LOW);
    unsigned long pulseTime = pulseIn(echoPin, HIGH);
    int distance = pulseTime / 58;
    return distance;
}

void printDistance(int id, int dist) {
    Serial.print(id);
    Serial.print("----->");
    Serial.print(dist, DEC);
    Serial.println(" cm");
}

```


LAMPIRAN B

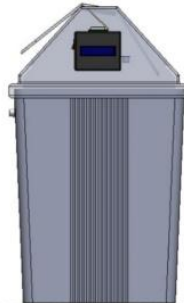
Desain Mekanik Alat



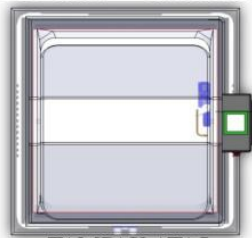
TAMPAK
KESELURUHAN



TAMPAK DEPAN



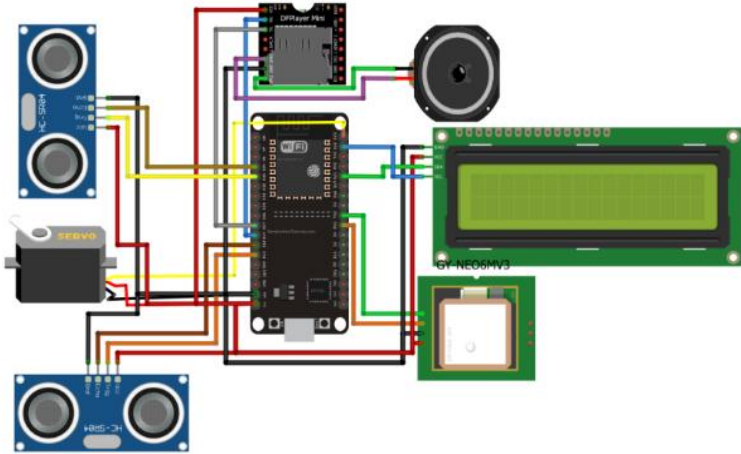
TAMPAK SAMPING



TAMPAK ATAS

LAMPIRAN C

Rangkaian Keseluruhan



LAMPIRAN D

Gambar Alat



BIODATA PENULIS



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Riwayat Pendidikan :

- SD Negeri Sidanegara 03 Tahun 2007 - 2013
- SMP Negeri 6 Cilacap Tahun 2013 - 2016
- SMK Negeri 2 Cilacap Tahun 2016 - 2019
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Penulis telah mengikuti sidang Tugas Akhir pada tanggal 28 Juli 2022, sebagai salah satu persyaratan untuk memperoleh gelar Ahli Madya (A.Md).