

LAMPIRAN A LIST PROGRAM

```
#include <Servo.h>

const int sensorPin = 2; // Pin digital untuk koneksi sensor optocoupler
volatile byte pulses = 0; // Variabel untuk menghitung pulsa dari sensor
unsigned int rpm = 0; // Variabel untuk menyimpan hasil perhitungan RPM
unsigned long startTime; // Variabel untuk menyimpan waktu awal deteksi putaran
unsigned long elapsedTime; // Variabel untuk menyimpan waktu yang diperlukan untuk satu putaran

const float lingkaranRoda = 0.3; // Lingkaran roda kendaraan dalam meter
const int pulsePerPutaran = 2; // Jumlah pulse per putaran dari sensor optocoupler

const int servoPin = 7;
const int potPin = A6;
const int button1Pin = 22; // UNTUK AKTIF CRUISE CONTROL
const int button2Pin = 24; // UNTUK MATI CRUISE CONTROL
const int button3Pin = 26; // UNTUK PEDAL REM
const int button4Pin = 28; // UNTUK MENAMBAH KECEPATAN 5
const int button5Pin = 30; // UNTUK MENGURANGI KECEPATAN 5

int potValueMotor = 0;
const int potPinMotor = A7;

const int trigPin = 5;
const int echoPin = 4;

int potValue = 0;
int lastPotValue = 0;
int button1State = 0;
int button2State = 0;
int button3State = 0;
int button4State = 0;
```

```

int button5State = 0;

int distance = 0;
int setpoint = 0;

bool followPot = true;

bool isButtonPressed = false;
byte led = 13;

Servo myservo;

void setup() {
  pinMode(sensorPin, INPUT_PULLUP);
  attachInterrupt(digitalPinToInterrupt(sensorPin), countPulse,
  FALLING);

  Serial.begin(9600);
  myservo.attach(servoPin);
  pinMode(button1Pin, INPUT_PULLUP);
  pinMode(button2Pin, INPUT_PULLUP);
  pinMode(button3Pin, INPUT_PULLUP);
  pinMode(button4Pin, INPUT_PULLUP);
  pinMode(button5Pin, INPUT_PULLUP);

  pinMode(led, OUTPUT);

  pinMode(trigPin, OUTPUT);
  pinMode(echoPin, INPUT);
}

void loop() {
  button1State = digitalRead(button1Pin);
  button2State = digitalRead(button2Pin);
  button3State = digitalRead(button3Pin);
  button4State = digitalRead(button4Pin);
  button5State = digitalRead(button5Pin);

  int servoPos = myservo.read();

```

```

Serial.write(0xff);
Serial.write(0xff);
Serial.write(0xff);

//===== PROGRAM MOTOR=====
potValueMotor = analogRead(potPinMotor);
int motorSpeed = map(potValueMotor, 730, 1010, 0, 75);
if (motorSpeed > 0) {
  analogWrite(10, motorSpeed); // ENA
}

else {
  analogWrite(10, LOW);
}
//===== PROGRAM MOTOR=====

//===== AKTIFKAN CRUISE CONTROL =====

if (servoPos >= 13 || button1State == HIGH) { // Cek jika nilai potensio
bukan 0 atau tombol tidak ditekan
  if (button1State == LOW) { // Tombol ditekan
    delay(50); // Debouncing sederhana
    if (button1State == LOW) { // Pastikan tombol masih dalam keadaan
ditekan
      isButtonPressed = !isButtonPressed; // Toggle status tombol
      delay(200); // Delay tambahan untuk mencegah bouncing saat
tombol dilepas
    }
  }
} else {
  isButtonPressed = false; // Setel status tombol ke false jika potensio
bernilai 0 dan tombol ditekan
}

if (isButtonPressed) {
  followPot = false;
// myservo.write(lastPotValue);

```

```

digitalWrite(led, HIGH);

digitalWrite(trigPin, LOW);
delayMicroseconds(2);
digitalWrite(trigPin, HIGH);
delayMicroseconds(10);
digitalWrite(trigPin, LOW);

// Membaca durasi respons dari pin echo
long duration = pulseIn(echoPin, HIGH);

// Menghitung jarak dalam sentimeter
float distance = duration * 0.034 / 2;
Serial.print("t2.txt=");
Serial.print(distance, 0);
Serial.write("\n");
Serial.write(0xff);
Serial.write(0xff);
Serial.write(0xff);

Serial.print("p3.pic=");
Serial.write("\n");
Serial.write(0xff);
Serial.write(0xff);
Serial.write(0xff);

}

else {
  followPot = true;
  digitalWrite(led, LOW);
}

//===== AKTIFKAN CRUISE CONTROL =====

```

```

//===== MATIKAN CRUISE CONTROL =====

if (button2State == LOW && isButtonPressed == true) { // CANCEL
    followPot = true;
    isButtonPressed = false;
}

if (button3State == LOW && isButtonPressed == true) { // REM
    followPot = true;
    isButtonPressed = false;
}

//===== MATIKAN CRUISE CONTROL =====

//===== TAMBAH CRUISE CONTROL =====

if (button4State == LOW && followPot == false && distance >50 ) { //
tambahkan kondisi if untuk button4

    followPot = false;
    int addedValue = 5; // nilai penambahan posisi servo
    myservo.write(lastPotValue + addedValue);
    lastPotValue += addedValue;
    int newPosition = lastPotValue + addedValue;
    delay(100);

    if (newPosition > 105) { // batas atas
        newPosition = 105;
    }
    else if (newPosition < 13) { // batas bawah
        newPosition = 13;
    }
    myservo.write(newPosition);
    lastPotValue = newPosition;
    delay (100);
}
//===== TAMBAH CRUISE CONTROL =====

```

```
//===== KURANG CRUISE CONTROL =====

if (button5State == LOW && followPot == false && distance > 50) { //
Decrease speed by 5

    int subtractedValue = 5;
    myservo.write(lastPotValue - subtractedValue);
    lastPotValue -= subtractedValue;
    int newPosition = lastPotValue - subtractedValue;
    delay(100);

    if (newPosition > 105) {
        newPosition = 105;
    }
    else if (newPosition < 13) {
        newPosition = 13;
    }

    myservo.write(newPosition);
    lastPotValue = newPosition;
    delay (100);

}
//===== KURANG CRUISE CONTROL =====
```

```
//===== PROGRAM BACA JARAK =====

else {
// digitalWrite(trigPin, LOW);
// delayMicroseconds(2);
// digitalWrite(trigPin, HIGH);
// delayMicroseconds(10);
// digitalWrite(trigPin, LOW);
// long duration = pulseIn(echoPin, HIGH);
// distance = duration * 0.034 / 2;
```

```

potValue = analogRead(potPin);
int setpoint = map(potValue, 0, 1023, 13, 105);

if (distance < 50 ) {
  myservo.write(5);
}
else if(setpoint >= lastPotValue && distance >50 ){
  myservo.write(setpoint);
}

else {
  myservo.write(lastPotValue);
}

}
//===== PROGRAM BACA JARAK =====

//===== PROGRAM PEDAL GAS =====

if (followPot) {
  potValue = analogRead(potPin);
  int setpoint = map(potValue, 0, 1023, 10, 105);
  myservo.write(setpoint);
  lastPotValue = setpoint;
}
//===== PROGRAM PEDAL GAS =====

//===== PROGRAM SPEDOMETER =====

// Hitung RPM setiap 1 detik
if (millis() - startTime > 1000) {
  detachInterrupt(digitalPinToInterrupt(sensorPin));
  elapsedTime = millis() - startTime;
  rpm = 60000 / elapsedTime * pulses;
  pulses = 0;
  startTime = millis();
}

```

```

// Hitung kecepatan kendaraan dalam km/jam
float kecepatanKmPerJam = (rpm * lingkaranRoda * 60.0) /
(pulsePerPutaran * 1000);

// Send speed value via Serial Monitor
Serial.print("t0.txt=\");
Serial.print(kecepatanKmPerJam, 0);
Serial.write("\");
Serial.write(0xff);
Serial.write(0xff);
Serial.write(0xff);

attachInterrupt(digitalPinToInterrupt(sensorPin), countPulse,
FALLING);
}
//===== PROGRAM SPEDOMETER =====

if (rpm < 1) {
Serial.print("j0.val=0");
Serial.write(0xff);
Serial.write(0xff);
Serial.write(0xff);
}

else if (rpm > 1 && rpm < 250) {
Serial.print("j0.val=2");
Serial.write(0xff);
Serial.write(0xff);
Serial.write(0xff);
}

else if (rpm > 250 && rpm < 500) {
Serial.print("j0.val=4");
Serial.write(0xff);
Serial.write(0xff);
Serial.write(0xff);
}

```



```
else if (rpm > 500 && rpm < 750) {
Serial.print("j0.val=6");
Serial.write(0xff);
Serial.write(0xff);
Serial.write(0xff);
}

else if (rpm > 750 && rpm < 1000) {
Serial.print("j0.val=10");
Serial.write(0xff);
Serial.write(0xff);
Serial.write(0xff);
}

else if (rpm > 1000 && rpm < 1250) {
Serial.print("j0.val=12");
Serial.write(0xff);
Serial.write(0xff);
Serial.write(0xff);
}

else if (rpm > 1250 && rpm < 1500) {
Serial.print("j0.val=14");
Serial.write(0xff);
Serial.write(0xff);
Serial.write(0xff);
}

else if (rpm > 1500 && rpm < 1750) {
Serial.print("j0.val=16");
Serial.write(0xff);
Serial.write(0xff);
Serial.write(0xff);
}

else if (rpm > 1750 && rpm < 2000) {
Serial.print("j0.val=20");
Serial.write(0xff);
```

```
Serial.write(0xff);
Serial.write(0xff);
}

else if (rpm > 2000 && rpm < 2250) {
Serial.print("j0.val=22");
Serial.write(0xff);
Serial.write(0xff);
Serial.write(0xff);
}

else if (rpm > 2250 && rpm < 2500) {
Serial.print("j0.val=24");
Serial.write(0xff);
Serial.write(0xff);
Serial.write(0xff);
}

else if (rpm > 2500 && rpm < 2750) {
Serial.print("j0.val=26");
Serial.write(0xff);
Serial.write(0xff);
Serial.write(0xff);
}

else if (rpm > 2750 && rpm < 3000) {
Serial.print("j0.val=30");
Serial.write(0xff);
Serial.write(0xff);
Serial.write(0xff);
}

else if (rpm > 3000 && rpm < 3250) {
Serial.print("j0.val=32");
Serial.write(0xff);
Serial.write(0xff);
Serial.write(0xff);
}
```

```
else if (rpm > 3250 && rpm < 3500) {  
  Serial.print("j0.val=34");  
  Serial.write(0xff);  
  Serial.write(0xff);  
  Serial.write(0xff);  
}
```

```
else if (rpm > 3500 && rpm < 3750) {  
  Serial.print("j0.val=36");  
  Serial.write(0xff);  
  Serial.write(0xff);  
  Serial.write(0xff);  
}
```

```
else if (rpm > 3750 && rpm < 4000) {  
  Serial.print("j0.val=40");  
  Serial.write(0xff);  
  Serial.write(0xff);  
  Serial.write(0xff);  
}
```

```
else if (rpm > 4000 && rpm < 4250) {  
  Serial.print("j0.val=42");  
  Serial.write(0xff);  
  Serial.write(0xff);  
  Serial.write(0xff);  
}
```

```
else if (rpm > 4250 && rpm < 4500) {  
  Serial.print("j0.val=44");  
  Serial.write(0xff);  
  Serial.write(0xff);  
  Serial.write(0xff);  
}
```

```
else if (rpm > 4500 && rpm < 4750) {  
  Serial.print("j0.val=46");  
  Serial.write(0xff);  
  Serial.write(0xff);  
  Serial.write(0xff);  
}
```

```
else if (rpm > 4750 && rpm < 5000) {
  Serial.print("j0.val=50");
  Serial.write(0xff);
  Serial.write(0xff);
  Serial.write(0xff);
}
else if (rpm > 5000 && rpm < 5250) {
  Serial.print("j0.val=52");
  Serial.write(0xff);
  Serial.write(0xff);
  Serial.write(0xff);
}
else if (rpm > 5250 && rpm < 5500) {
  Serial.print("j0.val=54");
  Serial.write(0xff);
  Serial.write(0xff);
  Serial.write(0xff);
}
else if (rpm > 5500 && rpm < 5750) {
  Serial.print("j0.val=56");
  Serial.write(0xff);
  Serial.write(0xff);
  Serial.write(0xff);
}

else if (rpm > 5750 && rpm < 6000) {
  Serial.print("j0.val=60");
  Serial.write(0xff);
  Serial.write(0xff);
  Serial.write(0xff);
}

else if (rpm > 6000 && rpm < 6250) {
  Serial.print("j0.val=62");
  Serial.write(0xff);
  Serial.write(0xff);
  Serial.write(0xff);
}
```

```
else if (rpm > 6250 && rpm < 6500) {  
  Serial.print("j0.val=64");  
  Serial.write(0xff);  
  Serial.write(0xff);  
  Serial.write(0xff);  
}
```

```
else if (rpm > 6500 && rpm < 6750) {  
  Serial.print("j0.val=66");  
  Serial.write(0xff);  
  Serial.write(0xff);  
  Serial.write(0xff);  
}
```

```
else if (rpm > 6750 && rpm < 7000) {  
  Serial.print("j0.val=70");  
  Serial.write(0xff);  
  Serial.write(0xff);  
  Serial.write(0xff);  
}
```

```
else if (rpm > 7000 && rpm < 7250) {  
  Serial.print("j0.val=72");  
  Serial.write(0xff);  
  Serial.write(0xff);  
  Serial.write(0xff);  
}
```

```
else if (rpm > 7250 && rpm < 7500) {  
  Serial.print("j0.val=74");  
  Serial.write(0xff);  
  Serial.write(0xff);  
  Serial.write(0xff);  
}
```

```
else if (rpm > 7500 && rpm < 7750) {  
  Serial.print("j0.val=76");  
  Serial.write(0xff);  
  Serial.write(0xff);  
  Serial.write(0xff);  
}
```

```
else if (rpm > 7750 && rpm < 8000) {
  Serial.print("j0.val=80");
  Serial.write(0xff);
  Serial.write(0xff);
  Serial.write(0xff);
}

else if (rpm > 8000 && rpm < 8250) {
  Serial.print("j0.val=82");
  Serial.write(0xff);
  Serial.write(0xff);
  Serial.write(0xff);
}

else if (rpm > 8250 && rpm < 8500) {
  Serial.print("j0.val=84");
  Serial.write(0xff);
  Serial.write(0xff);
  Serial.write(0xff);
}
else if (rpm > 8500 && rpm < 8750) {
  Serial.print("j0.val=86");
  Serial.write(0xff);
  Serial.write(0xff);
  Serial.write(0xff);
}
else if (rpm > 8750 && rpm < 9000) {
  Serial.print("j0.val=90");
  Serial.write(0xff);
  Serial.write(0xff);
  Serial.write(0xff);
}
else if (rpm > 9000 && rpm < 9250) {
  Serial.print("j0.val=92");
  Serial.write(0xff);
  Serial.write(0xff);
  Serial.write(0xff);
}
```

```

else if (rpm > 9250 && rpm < 9500) {
  Serial.print("j0.val=94");
  Serial.write(0xff);
  Serial.write(0xff);
  Serial.write(0xff);
}

else if (rpm > 9500 && rpm < 9750) {
  Serial.print("j0.val=96");
  Serial.write(0xff);
  Serial.write(0xff);
  Serial.write(0xff);
}
else if (rpm > 9750 && rpm > 10000) {
  Serial.print("j0.val=100");
  Serial.write(0xff);
  Serial.write(0xff);
  Serial.write(0xff);
}
//===== PROGRAM SPEDOMETER=====

digitalWrite(trigPin, LOW);
  delayMicroseconds(2);
  digitalWrite(trigPin, HIGH);
  delayMicroseconds(10);
  digitalWrite(trigPin, LOW);
  long duration = pulseIn(echoPin, HIGH);
  distance = duration * 0.034 / 2;

Serial.print(", Setpoint: ");
Serial.print(lastPotValue);
Serial.print("SERVO : ");
Serial.println(servoPos);
}

void countPulse() {
  pulses++;
}

```

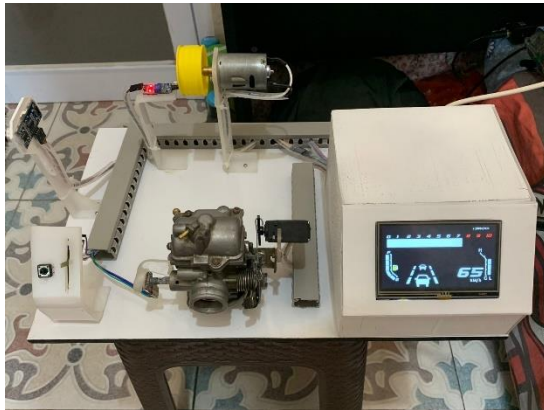
LAMPIRAN B



Gambar 1 Alat Tampak Atas



Gambar 2 Alat Tampak Depan



Gambar 3 Pengujian Alat

BIODATA PENULIS



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Riwayat Pendidikan

- SD Negeri Tridaya Sakti 01 2008 – 2014
- SMP Negeri 2 Tambun Selatan 2014 – 2017
- SMK Negeri 1 Cikarang Barat 2017 – 2020
- Politeknik Negeri Cilacap 2020 – 2023

Penulis telah mengikuti seminar Tugas Akhir pada tanggal 09 Agustus 2023 sebagai salah satu persyaratan untuk memperoleh gelar Ahli Madya (A,Md).