LAMPIRAN

Lampiran 1. Program Prototipe Alat

```
String inputString = "";         // a string to hold incoming data
boolean stringComplete = false;  // whether the string is complete
String dataKirim ;
unsigned long delay1;
int timer = 40;
char lampu1[3] = "40";
char lampu1int = 40;
char lamer1[3];
char lamer2[3];
char lamer3[3];
char lamer4[3];
int lamp_lamer1[4] = {2, 3, 4, 5}; //merah lurus aktif low
int lamp_lamer2[4] = {A0, A1, A2, A3}; //hijau lurus aktif high
int lamp_lamer3[4] = {A4, A5, A6, A7}; //kuning lurus aktif HIGH
int lamp_lamer4[4] = {A8, A9, A10, A11};
int sensor[4] = {10,11, 12, 13};
int tempA = 40;
int seven1_1 = 0;
bool merah[4];
bool hijau[4];
String sensorStr="0000";
#include "sevenSegment.h"
#include "lampuEdy.h"
void setup() {
  Serial.begin(9600);
  Serial1.begin(9600);
  // put your setup code here, to run once:
  pinMode(2, OUTPUT);
  pinMode(3, OUTPUT);
```

```
  pinMode(4, OUTPUT);
  for (int x = 0 ; x < 5; x++) {
    pinMode(lamp_lamer1[x], OUTPUT);
    pinMode(lamp_lamer2[x], OUTPUT);
    pinMode(lamp_lamer3[x], OUTPUT);
    pinMode(lamp_lamer4[x], OUTPUT);
    pinMode(sensor[x], INPUT_PULLUP);
  }
  for (int x = 0 ; x < 5; x++) {
    digitalWrite(lamp_lamer1[x], HIGH);
    delay(10);
  }
  for (int x = 0 ; x < 5; x++) {
    digitalWrite(lamp_lamer1[x], LOW);
    delay(10);
  }

  for (int x = 22 ; x < 54; x++) {
    pinMode(x, OUTPUT);
  }
  delay1 = millis();
}
bool startLamer = true;
void loop() {
  // print the string when a newline arrives:
  if (stringComplete) {
    Serial.println(inputString);
    if (inputString == "start#") {
      startLamer = true;
    }
    // clear the string:
```

```
  inputString = "";
  stringComplete = false;
 }
 if (startLamer) {
  if (millis() - delay1 > 200) { // delay lampu merah 200 miliseconds, di ganti jadi
1000

    run();
    bacaSensor();
    tempA--;
    dataKirim = lamer1;
    dataKirim += ",";
    dataKirim += lamer2;
    dataKirim += ",";
    dataKirim += lamer3;
    dataKirim += ",";
    dataKirim += lamer4;
    dataKirim += ",";
    dataKirim += sensorStr;
    dataKirim += ",";
    dataKirim += "#";
    Serial.print(dataKirim);
    //  Serial2.print(dataKirim);
    fungsi_lamer1();
    fungsi_lamer2();
    fungsi_lamer3();
    fungsi_lamer4();

    dataKirim = "";
    sensorStr="";
    delay1 = millis();
```

```
    }
  }

}
int selisihLampKuning = 3;
void run() {
  Serial1.println(tempA);
  if (tempA >= 30 + selisihLampKuning && tempA - selisihLampKuning <= 40) {
    Serial1.println(" lampu 1");
    //hijau
    digitalWrite(lamp_lamer1[0], LOW);
    digitalWrite(lamp_lamer1[1], LOW);
    digitalWrite(lamp_lamer1[2], LOW);
    digitalWrite(lamp_lamer1[3], HIGH);
    //merah
    digitalWrite(lamp_lamer2[0], LOW);
    digitalWrite(lamp_lamer2[1], LOW);
    digitalWrite(lamp_lamer2[2], LOW);
    digitalWrite(lamp_lamer2[3], HIGH);
  }
  else if (tempA >= 20 + selisihLampKuning &&  tempA - selisihLampKuning <=
30) {
    Serial1.println(" lampu 2");
    //merah
    digitalWrite(lamp_lamer1[0], LOW);
    digitalWrite(lamp_lamer1[1], LOW);
    digitalWrite(lamp_lamer1[2], HIGH);
    digitalWrite(lamp_lamer1[3], LOW);
    //hijau
    digitalWrite(lamp_lamer2[0], LOW);
    digitalWrite(lamp_lamer2[1], LOW);
```

```
    digitalWrite(lamp_lamer2[2], HIGH);
    digitalWrite(lamp_lamer2[3], LOW);
  }   else if (tempA >= 10 + selisihLampKuning &&  tempA - selisihLampKuning
<= 20) {
    Serial1.println(" lampu 3");
    digitalWrite(lamp_lamer1[0], LOW);
    digitalWrite(lamp_lamer1[1], HIGH);
    digitalWrite(lamp_lamer1[2], LOW);
    digitalWrite(lamp_lamer1[3], LOW);
    //hijau
    digitalWrite(lamp_lamer2[0], LOW);
    digitalWrite(lamp_lamer2[1], HIGH);
    digitalWrite(lamp_lamer2[2], LOW);
    digitalWrite(lamp_lamer2[3], LOW);
  }   else if (tempA >= 0 + selisihLampKuning &&  tempA - selisihLampKuning
<= 10) {
    Serial1.println(" lampu 4");
    digitalWrite(lamp_lamer1[0], HIGH);
    digitalWrite(lamp_lamer1[1], LOW);
    digitalWrite(lamp_lamer1[2], LOW);
    digitalWrite(lamp_lamer1[3], LOW);
    //hijau
    digitalWrite(lamp_lamer2[0], HIGH);
    digitalWrite(lamp_lamer2[1], LOW);
    digitalWrite(lamp_lamer2[2], LOW);
    digitalWrite(lamp_lamer2[3], LOW);
  }
  //* lampu kuning **********************************/
  if (tempA <= 30 + selisihLampKuning &&  tempA >= 30  ) {
    digitalWrite(lamp_lamer3[0], LOW);
    digitalWrite(lamp_lamer3[1], LOW);
```

```
  digitalWrite(lamp_lamer3[2], LOW);
  digitalWrite(lamp_lamer3[3], HIGH);
} else if (tempA <= 20 + selisihLampKuning &&  tempA >= 20  ) {
  digitalWrite(lamp_lamer3[0], LOW);
  digitalWrite(lamp_lamer3[1], LOW);
  digitalWrite(lamp_lamer3[2], HIGH);
  digitalWrite(lamp_lamer3[3], LOW);
}
else if (tempA <= 10 + selisihLampKuning &&  tempA >= 10  ) {
  digitalWrite(lamp_lamer3[0], LOW);
  digitalWrite(lamp_lamer3[1], HIGH);
  digitalWrite(lamp_lamer3[2], LOW);
  digitalWrite(lamp_lamer3[3], LOW);
}
else if (tempA <= 0 + selisihLampKuning && tempA >= 0  ) {
  digitalWrite(lamp_lamer3[0], HIGH);
  digitalWrite(lamp_lamer3[1], LOW);
  digitalWrite(lamp_lamer3[2], LOW);
  digitalWrite(lamp_lamer3[3], LOW);
} else {
  digitalWrite(lamp_lamer3[0], LOW);
  digitalWrite(lamp_lamer3[1], LOW);
  digitalWrite(lamp_lamer3[2], LOW);
  digitalWrite(lamp_lamer3[3], LOW);
}


//ganti disini
// saya pakai kelipatan 10 detik untuk lampu hijaunya
// silakan ganti menurut logika anda
if (tempA == 40) {
```

```
    strcpy(lamer1, "10");
    strcpy(lamer2, "20");
    strcpy(lamer3, "30");
    strcpy(lamer4, "40");
  } else if (tempA == 30) {

    strcpy(lamer1, "40");
    strcpy(lamer2, "10");
    strcpy(lamer3, "20");
    strcpy(lamer4, "30");
  } else if (tempA == 20) {

    strcpy(lamer1, "30");
    strcpy(lamer2, "40");
    strcpy(lamer3, "10");
    strcpy(lamer4, "20");
  } else if (tempA == 10) {
    strcpy(lamer1, "20");
    strcpy(lamer2, "30");
    strcpy(lamer3, "40");
    strcpy(lamer4, "10");
  } else if (tempA == 0) {
    tempA = 41;
  }

}
void serialEvent() {
  while (Serial.available()) {
    // get the new byte:
    char inChar = (char)Serial.read();
```

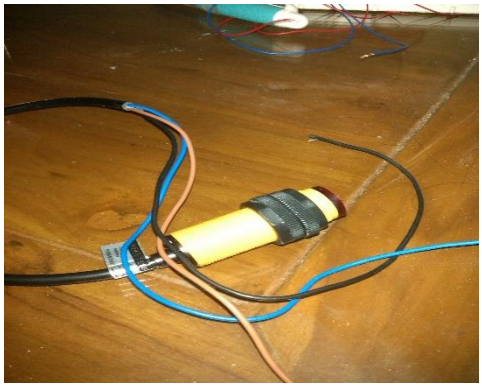
```
    // add it to the inputString:
    inputString += inChar;
    // if the incoming character is a newline, set a flag
    // so the main loop can do something about it:
    if (inChar == '#') {
      stringComplete = true;
    }
  }
}
int flagSensor[4]={0,0,0,0};
void bacaSensor(){

  for(int x=0;x<4;x++){
    if(digitalRead(sensor[x])==0){
      if(flagSensor[x]==0){
    sensorStr+="1";
    flagSensor[x]=1;}else{
      sensorStr+="0";
      }
      }else{
          sensorStr+="0";
          flagSensor[x]=0;
        }
    }

  }
```

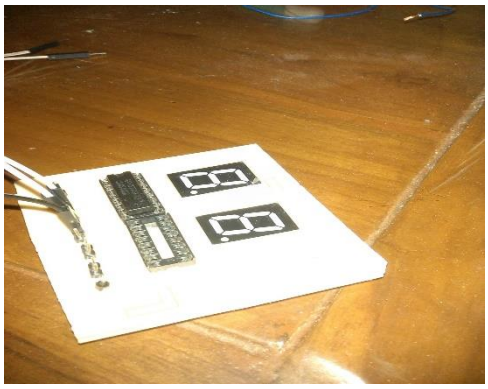
Lampiran 2. Foto komponen alat

Sensor jarak Proximity

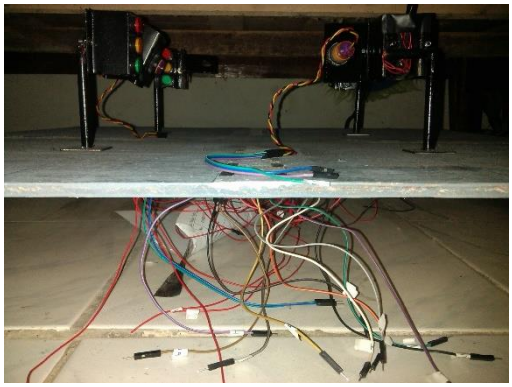


Lampu Lalu lintas

Seven Segment



Maket Traffic Light



Arduino Mega 2560

Kamera Webcam

Adaptor Switch 12 VDC

Tata Letak Komponen pada Maket