LAMPIRAN

///////////////////sensor SUHU udara///////////////////

```
void SENSOR_SUHU_UDARA(){

  delay(100);

  float h = dht.readHumidity();

  float t = dht.readTemperature();

  if (isnan(h) || isnan(t)) {

    Serial.println("Failed to read from DHT sensor!");

    return;

  }

  Serial.print("Humidity: ");

  lcd.setCursor(0,2);

  lcd.print("HUM: ");

  lcd.print(h);

  Serial.print(h);
```

```
        Serial.println(" %\t");

        Serial.print("Temperature: ");

        lcd.setCursor(0,3);

        lcd.print("T.UDARA: ");

        lcd.print(t);

        //lcd.print("*C");

        Serial.print(t);

        Serial.println("*C");

                        }



//////////////////////////kontrol relay/////////////////////////////////////
int relay_motor =  8;    // no.relay
int relay_heater = A3;    // no.relay



//////////////////////////LCD//////////////////////////////
#include<LiquidCrystal.h>
const int rs = 6, en = 7, d4 = 5, d5 = 4, d6 = 3, d7 = 2;
```

```
LiquidCrystal lcd(rs, en, d4, d5, d6, d7);void setup() {

 // put your setup code here, to run once:

 lcd.begin(20,4);

}

unsigned long timeold;


//////////////////////sensor Jarak////////////////////////////////

const int trigPin = 10;

const int echoPin = 9;

long duration;

int distanceCm, distanceInch;


//////////////////////sensor tegangan///////////////////////////////

void setup() {

 // put your setup code here, to run once:

 R1=100000.0; // pembagi tegangan

 R2=10000.0;  // pembagi tegangan

}

void TEGANGAN_PV(){
```

63

```
adc_11 = analogRead(A2); //pembacaan sensor

delay (100); //waktu jeda 3ms

adc_12 = analogRead(A2); //pembacaan sensor

delay (100); //waktu jeda 3ms

adc_13 = analogRead(A2); //pembacaan sensor

delay (100); //waktu jeda 3ms

adc_14 = analogRead(A2); //pembacaan sensor

delay (100); //waktu jeda 3ms

adc_15 = analogRead(A2); //pembacaan sensor

delay (100); //waktu jeda 3ms

ADC_tot2 = (adc_11+adc_12+adc_13+adc_14+adc_15)/5;

 Vout_2 = (ADC_tot2 * 5.0) / 1024.0;

 Vinput_2 = Vout_2 / (R2/(R1+R2));

 if (Vinput_2<0.09) {

  Vinput_2=0.0; }

  Serial.print("PV = ");
```

```
   Serial.print(Vinput_1);

   lcd.setCursor(0,2);

   lcd.print("V. PV    : ");

   lcd.setCursor(11,2);

   lcd.print(Vinput_1);

   lcd.print(" ");

   Serial.print("\r\n"); }

void TEGANGAN_BATTERY(){

adc_11 = analogRead(A1); //pembacaan sensor

delay (50); //waktu jeda 3ms

adc_12 = analogRead(A1); //pembacaan sensor

delay (50); //waktu jeda 3ms

adc_13 = analogRead(A1); //pembacaan sensor

delay (50); //waktu jeda 3ms

adc_14 = analogRead(A1); //pembacaan sensor

delay (50); //waktu jeda 3ms
```

```
adc_15 = analogRead(A1); //pembacaan sensor

delay (50); //waktu jeda 3ms

ADC_tot2 = (adc_11+adc_12+adc_13+adc_14+adc_15)/5;

 Vout_2 = (ADC_tot2 * 5.0) / 1024.0;

 Vinput_2 = (Vout_2 / (R2/(R1+R2)));

 if (Vinput_2<0.09) {

  Vinput_2=0.0;

  }

  Serial.print("BATTERY = ");

  Serial.print(Vinput_2);

  lcd.setCursor(0,3);

  lcd.print("V. BATT   : ");

  lcd.setCursor(11,3);

  lcd.print(Vinput_2);

  lcd.print(" ");

  Serial.print("\r\n");
```

```
}

////////////////////////////kecepatan/////////////////////

attachInterrupt(0, rpm_fun, RISING);

half_revolutions = 0;

rpm = 0;

timeold = 0;

///////////////////////////suhu/////////////////////////////////////

//pinMode(vccPin, OUTPUT); digitalWrite(vccPin, HIGH);

//pinMode(gndPin, OUTPUT); digitalWrite(gndPin, LOW);


////////////////////////relay//////////////////////////////////////

pinMode(relay_heater,OUTPUT);  // relay heater

pinMode(relay_motor,OUTPUT); // relay motor


////////////////////////jarak//////////////////////////////////////

pinMode(trigPin, OUTPUT);

pinMode(echoPin, INPUT);


//////////////////sensor tegangan//////////////////////////////////////

R1=100000.0;
```

```
  R2=10000.0;


  ////////////////Tampilan awal/////////////////////////////////

  lcd.setCursor(0,0);

  lcd.print("**TUGAS  AKHIR**");

  lcd.setCursor(0,1);

  lcd.print("*ELEKTRO TENAGA*");

  delay(5000);

  lcd.setCursor(0,0);

  lcd.print("*RAHMAT AGUS SUYATNO*");

  lcd.setCursor(0,1);

  lcd.print("*NIM : 14041032*");

  delay(5000);

  lcd.clear();


  ///////////////Hasil awal//////////////////////////////////

  Serial.println("awal ");

  digitalWrite(relay_motor,LOW);

}


void loop() {
```

```
  // put your main code here, to run repeatedly:

 menu:

while(1)

{

  Serial.println("mulai ");

  Suhu();

  TEGANGAN();

  digitalWrite(relay_motor, HIGH);

  //digitalWrite(relay_heater, HIGH); //relay menyala


}
}



////////////////////////sensor kecepatan////////////////////

void Kecepatan()

{

  rpm = 30*1000/(millis() - timeold)*half_revolutions;

    timeold = millis();

    half_revolutions = 0;

    Serial.println(rpm,DEC);
```

```
  lcd.setCursor(0,1);

  lcd.print("R:");

  lcd.print(rpm,DEC);

  lcd.print("  ");

  delay(100);

}

void rpm_fun()

{

  half_revolutions++;

}


///////////////////////////sensor suhu///////////////////////

void Suhu(){

  Serial.print("C = ");

  Serial.println(thermocouple.readCelsius());

  lcd.setCursor(7,1);

  lcd.print("C:");

  //lcd.setCursor(12,1);

  lcd.print(thermocouple.readCelsius());

  //Serial.print("F = ");

  //Serial.println(thermocouple.readFahrenheit());
```

```
  if( thermocouple.readCelsius() < 150.00){ //jika suhu lebih kecil

   digitalWrite(relay_heater, HIGH); //relay menyala

  }


  else{ //jika tidak

   digitalWrite(relay_heater, LOW); //relay mati

  }

   delay(250);

}



///////////////////////////sensor jaraj///////////////////////
void Jarak(){
digitalWrite(trigPin, LOW);

delayMicroseconds(2);

digitalWrite(trigPin, HIGH);

delayMicroseconds(10);

digitalWrite(trigPin, LOW);

duration = pulseIn(echoPin, HIGH);

distanceCm= duration*0.034/2;

distanceInch = duration*0.0133/2;
```

```
//lcd.setCursor(0,0); // Sets the location at which subsequent text
written to the LCD will be displayed

Serial.print("Distance: "); // Prints string "Distance" on the LCD

Serial.print(distanceCm); // Prints the distance value from the sensor

Serial.println(" cm");

lcd.setCursor(0,0);

lcd.print("J:");

//lcd.setCursor(12,0);

lcd.print(distanceCm);

lcd.print("  ");

delay(10);




//lcd.setCursor(0,1);

//Serial.print("Distance: ");

//Serial.print(distanceInch);

//Serial.println(" inch");

//delay(10);

}


/////////////////////////////////sensor tegangan/////////////////
```

```
void TEGANGAN(){

adc_1 = analogRead(A0); //pembacaan sensor

//delay (50);

adc_2 = analogRead(A0); //pembacaan sensor

//delay (50);

adc_3 = analogRead(A0); //pembacaan sensor

//delay (50);

adc_4 = analogRead(A0); //pembacaan sensor

//delay (50);

adc_5 = analogRead(A0); //pembacaan sensor

//delay (50);

ADC_tot0 = (adc_1+adc_2+adc_3+adc_4+adc_5)/5;

 Vout_0 = (ADC_tot0 * 4.8) / 1024.0;

 Vinput_0 = (Vout_0 / (R2/(R1+R2)));

 if (Vinput_0<0.08) {

  Vinput_0=0.0;

  }

  Serial.print("Volt = ");

  Serial.println(Vinput_0);

  lcd.setCursor(7,0);

  lcd.print("V:");
```

73

```
//lcd.setCursor(3,0);

lcd.print(Vinput_0);

//delay(10);


}
```

PROFIL PENULIS

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NIM   : 14.041.032

TTL   : Surabaya, 27 Agustus 1992

Penulis lahir di Surabaya pada tanggal 27 Agustus 1992. Mengenyam Pendidikan pertamanya dari keluarga kemudian dimasukkan di SDN Kertajaya 7 di Surabaya, kemudian melanjutkan studi ke SMP NEGERI 39 Surabaya dan menempuh jenjang menengah atas di SMK NEGERI 3 Surabaya. Pada tahun 2014 penulis kuliah di Prodi Teknik Elektro di bidang Sistem Tenaga di Universitas Bhayangkara Surabaya. Pada bulan Desember 2018 penulis meyelesaikan perkuliahan dengan judul **"*RANCANG BANGUN SISTEM PENGENDALI SUHU UDARA DALAM GREENHOUSE DENGAN MENGGUNAKAN SEL SURYA*"**