

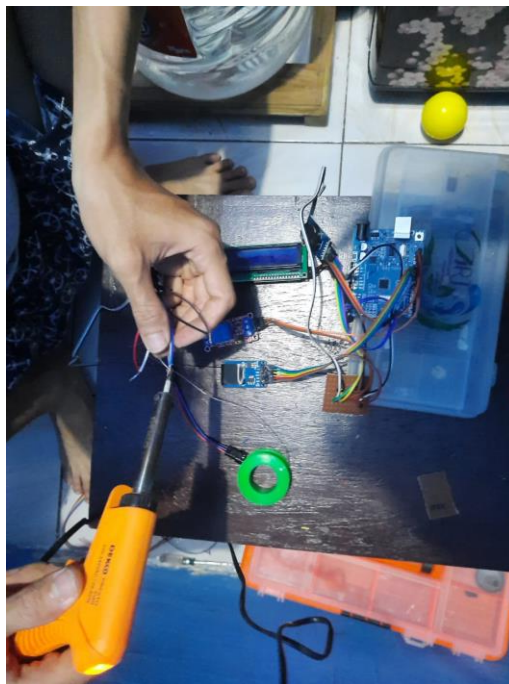
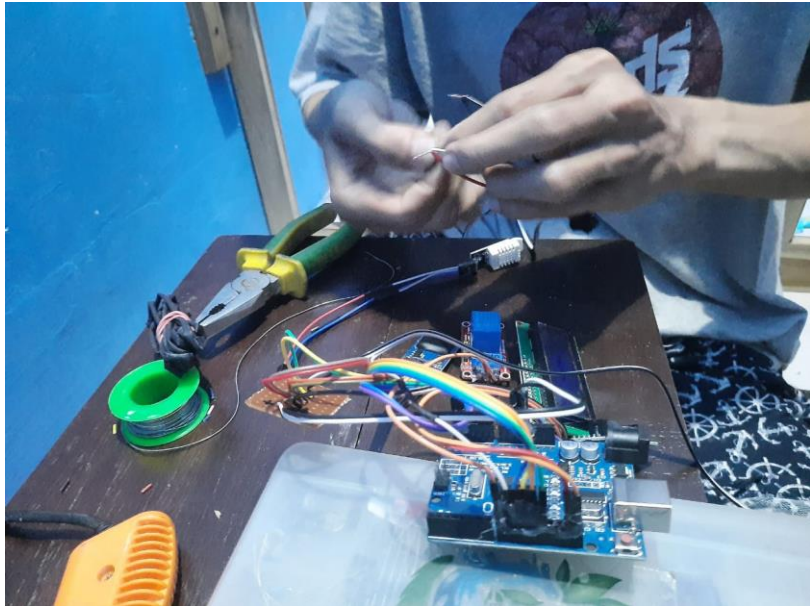
LAMPIRAN

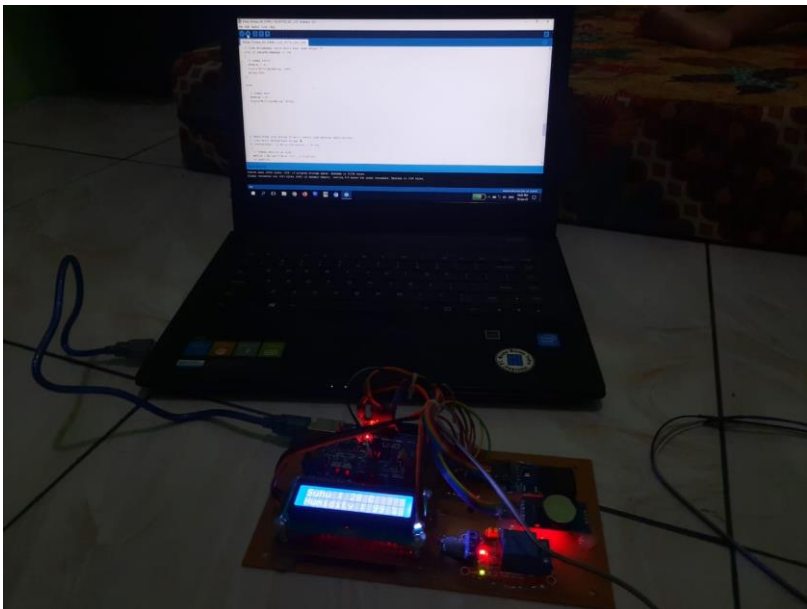
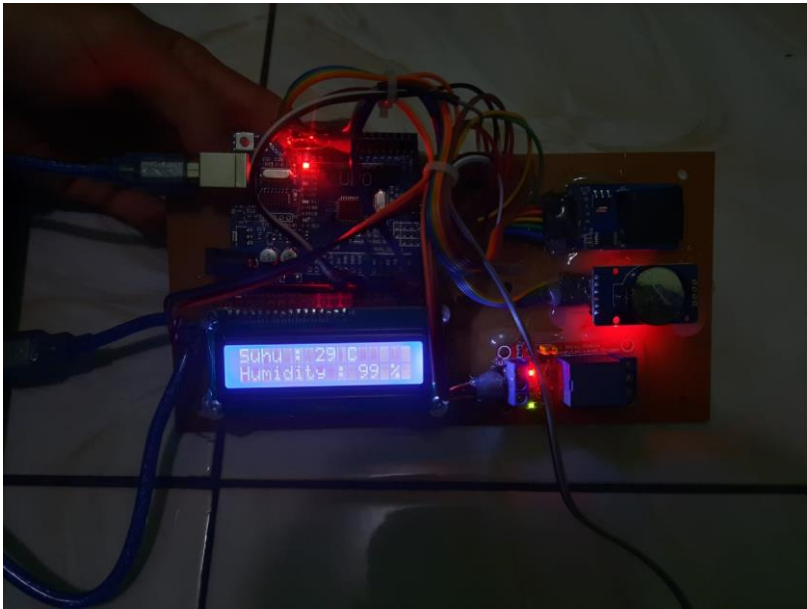
Pembuatan Turbin Angin



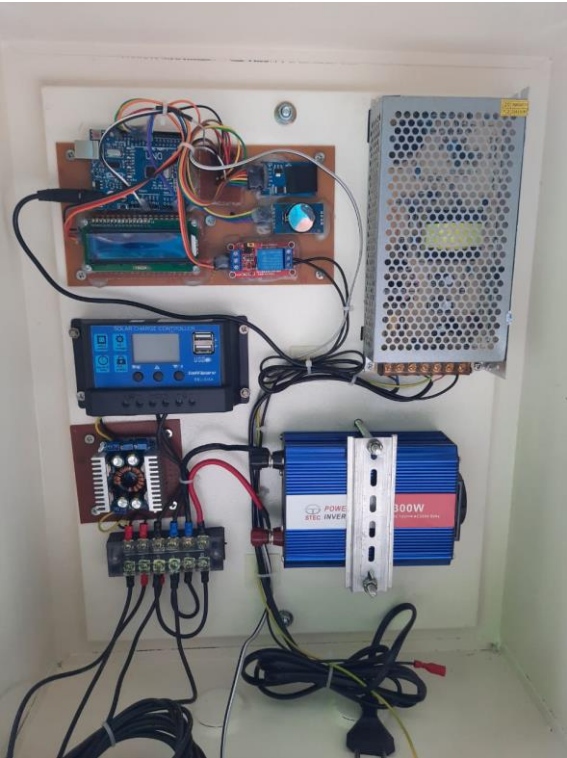


Perakitan Rangkaian Control





Komponen Sistem Pada Panel



Program Kontrol Otomatisasi Suhu dan Kelembaban

```
// --- Program ON/OFF Pompa Berdasarkan Suhu dan Kelembaban
DHT22 Sensor
// --- Dengan penyimpanan data pada SD Card

// memanggil library untuk program

#include<SPI.h>
#include <Wire.h>
#include "RTClib.h"
#include "DHT.h"
#include<SD.h>
#include <LiquidCrystal_I2C.h>

//inialisasi alamat i2c lcd lcd
LiquidCrystal_I2C lcd(0x27, 16, 2);

// inialisasi tipe DHT
#define DHTTYPE DHT22
// inialisasi pin sensor DHT
#define DHTPIN 9

// inialisasi DHT sensor
DHT dht(DHTPIN, DHTTYPE);

// inialisasi variabel
int dataSuhu, dataKelembaban;
int kondisi = 0;

// deklarasi Micro SD
File myFile;
// deklarasi RTC
RTC_DS3231 rtc;

//Inialisasi hari
char dayOfTheWeek[7][12] = {"Minggu", "Senin", "Selasa",
"Rabu", "Kamis", "Jumat", "Sabtu"};

// inialisasi pin relay
const int pinRelay = 8;

// inialisasi SD Card
Sd2Card card;
SdVolume volume;
SdFile root;

// inialisasi pin CS (Chip Select) SD Card
```

```

const int chipSelect = 10;

// ----- program default/setting awal ----- //
void setup()
{
  // inialisasi baud rate komunikasi serial monitor
  Serial.begin(9600);

  // inialisasi awal SD Card dan pin CS (Chip select)
  SD.begin(chipSelect);

  // inialisasi awal RTC
  rtc.begin();

  // inialisasi awal dht sensor
  dht.begin();

  // inialisasi awal lcd
  lcd.begin();

  // tulisan awal
  lcd.clear();
  lcd.setCursor(0, 0);
  lcd.print("System ON/OFF");
  lcd.setCursor(0, 1);
  lcd.print("Pompa Pengkabutan");
  delay(1500);

  lcd.clear();
  lcd.setCursor(0, 0);
  lcd.print("Ready .....");
  delay(1500);

  // inialisasi status I/O pin relay
  pinMode(pinRelay, OUTPUT);
  // mematikan relay di awal program
  digitalWrite(pinRelay, HIGH);
}

// ----- program utama, looping/berulang terus-menerus ---
// ----- //
void loop()

```

```

{
  //Menuliskan waktu yang terbaca pada RTC
  DateTime now = rtc.now();

  // membaca suhu dari sensor dht11
  dataSuhu = dht.readTemperature();
  dataKelembaban = dht.readHumidity();

  // menuliskan suhu dan kelembaban pada lcd
  lcd.clear();
  lcd.setCursor(0, 0);
  lcd.print("Suhu : ");
  lcd.setCursor(7, 0);
  lcd.print(dataSuhu);
  lcd.setCursor(10, 0);
  lcd.print("C");

  lcd.setCursor(0, 1);
  lcd.print("Humidity : ");
  lcd.setCursor(11, 1);
  lcd.print(dataKelembaban);
  lcd.setCursor(14, 1);
  lcd.print("%");
  delay(1500);

  // menuliskan kondisi ON/OFF relay pompa
  lcd.clear();
  lcd.setCursor(0, 0);
  if (kondisi == 0)
  {
    lcd.print("Pompa Kabut OFF");
  }

  else if (kondisi == 1)
  {
    lcd.print("Pompa Kabut ON");
  }

  //Menuliskan jam pada lcd
  lcd.setCursor(0, 1);
  lcd.print("Jam : ");
  lcd.setCursor(6, 1);
  lcd.print(now.hour());
  lcd.setCursor(8, 1);
  lcd.print(":");
  lcd.setCursor(9, 1);
  lcd.print(now.minute());
}

```



```

delay(1500);

// ===== program menyalakan pompa

// jika suhu lebih besar atau sama dengan 27 celcius
if (dataSuhu >= 27)
{
    // pompa aktif
    kondisi = 1;
    digitalWrite(pinRelay, LOW);
    delay(100);
}

// jika kelembaban lebih kecil atau sama dengan 79
else if (dataKelembaban <= 79)
{
    // pompa aktif
    kondisi = 1;
    digitalWrite(pinRelay, LOW);
    delay(100);
}

else
{
    // pompa mati
    kondisi = 0;
    digitalWrite(pinRelay, HIGH);
}

// menuliskan data setiap menit sekali pada setting waktu
berikut
// jika detik menunjukkan 00
if (now.second() == 00)
{
    // Simpan data ke sd Card
    myFile = SD.open("data1.txt", FILE_WRITE);
    if (myFile)
    {
        Serial.print("Simpan data ke micro SD");

        //Menuliskan tanggal pada SD Card

```

```

myFile.print(now.day());
myFile.print("-");
myFile.print(now.month());
myFile.print("-");
myFile.print(now.year());

//Menuliskan jam pada SD Card
myFile.print(" ");
myFile.print(now.hour());
myFile.print(":");
myFile.print(now.minute());
myFile.print(":");
myFile.print(now.second());

//Menuliskan pembacaan sensor pada SD Card
myFile.print(" ");
myFile.print("Suhu : ");
myFile.print(dht.readTemperature());
myFile.print(" ");
myFile.print("Kelembaban : ");
myFile.println(dht.readHumidity());

// menutup penulisan pada SD card
myFile.close();
delay(2000);
Serial.println(" Berhasil... ");
}

// jika gagal menulis pada SD Card
else
{
    Serial.println("error buka file");
    Serial.println(" data1.txt");
}
}

//Menuliskan tanggal dan jam pada serial monitor
Serial.print(now.year(), DEC);
Serial.print('/');
Serial.print(now.month(), DEC);
Serial.print('/');
Serial.print(now.day(), DEC);
Serial.print(" ");
Serial.print(dayOfTheWeek[now.dayOfTheWeek()]);
Serial.print(" ");
Serial.print(now.hour(), DEC);
Serial.print(':');
Serial.print(now.minute(), DEC);
Serial.print(':');

```

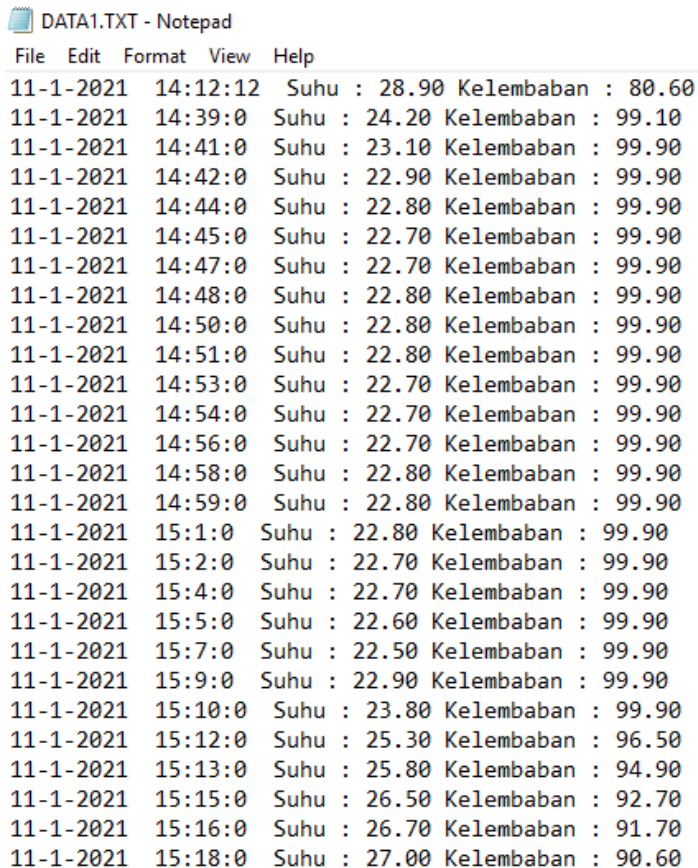
```

Serial.print(now.second(), DEC);
Serial.println();

}

```

Data yang Ditampilkan Pada SD Card



DATA1.TXT - Notepad

File	Edit	Format	View	Help
11-1-2021	14:12:12	Suhu : 28.90	Kelembaban : 80.60	
11-1-2021	14:39:0	Suhu : 24.20	Kelembaban : 99.10	
11-1-2021	14:41:0	Suhu : 23.10	Kelembaban : 99.90	
11-1-2021	14:42:0	Suhu : 22.90	Kelembaban : 99.90	
11-1-2021	14:44:0	Suhu : 22.80	Kelembaban : 99.90	
11-1-2021	14:45:0	Suhu : 22.70	Kelembaban : 99.90	
11-1-2021	14:47:0	Suhu : 22.70	Kelembaban : 99.90	
11-1-2021	14:48:0	Suhu : 22.80	Kelembaban : 99.90	
11-1-2021	14:50:0	Suhu : 22.80	Kelembaban : 99.90	
11-1-2021	14:51:0	Suhu : 22.80	Kelembaban : 99.90	
11-1-2021	14:53:0	Suhu : 22.70	Kelembaban : 99.90	
11-1-2021	14:54:0	Suhu : 22.70	Kelembaban : 99.90	
11-1-2021	14:56:0	Suhu : 22.70	Kelembaban : 99.90	
11-1-2021	14:58:0	Suhu : 22.80	Kelembaban : 99.90	
11-1-2021	14:59:0	Suhu : 22.80	Kelembaban : 99.90	
11-1-2021	15:1:0	Suhu : 22.80	Kelembaban : 99.90	
11-1-2021	15:2:0	Suhu : 22.70	Kelembaban : 99.90	
11-1-2021	15:4:0	Suhu : 22.70	Kelembaban : 99.90	
11-1-2021	15:5:0	Suhu : 22.60	Kelembaban : 99.90	
11-1-2021	15:7:0	Suhu : 22.50	Kelembaban : 99.90	
11-1-2021	15:9:0	Suhu : 22.90	Kelembaban : 99.90	
11-1-2021	15:10:0	Suhu : 23.80	Kelembaban : 99.90	
11-1-2021	15:12:0	Suhu : 25.30	Kelembaban : 96.50	
11-1-2021	15:13:0	Suhu : 25.80	Kelembaban : 94.90	
11-1-2021	15:15:0	Suhu : 26.50	Kelembaban : 92.70	
11-1-2021	15:16:0	Suhu : 26.70	Kelembaban : 91.70	
11-1-2021	15:18:0	Suhu : 27.00	Kelembaban : 90.60	