LAMPIRAN

main program

```
#include <OneWire.h>
#include <DallasTemperature.h>
#include <dhtESP32-rmt.h>
#include <WiFi.h>
#include <ESP32Firebase.h>
#include <LCD-I2C.h>
#include <TimerEvent.h>

#define REFERENCE_URL
"https://jembatani-c0a0b-default-
rtdb.firebaseio.com"  // Project URL
Firebase
#define I2C_SDA_PIN 21
#define I2C_SCL_PIN 22
#define ONE_WIRE_BUS 18
#define relay_pin 32

const char* ssid = "jembatani";
const char* password =
"jembataniApp";

const unsigned int interval1 = 1000;
const unsigned int interval2 = 500;

String data1;

int soil_moist;

float suhu;

float temperature = 0;
float humidity = 0;
uint8_t get_dht11;

OneWire oneWire(ONE_WIRE_BUS);
DallasTemperature DS18B20(&oneWire);

LCD_I2C lcd(0x27, 16, 2);
Firebase firebase(REFERENCE_URL);
TimerEvent timer1;
TimerEvent timer2;

void setup() {

  Serial.begin(115200);
  pinMode(relay_pin, OUTPUT);
  DS18B20.begin();
  lcd.begin();
  lcd.display();
  lcd.backlight();
  delay(500);
  power_on();
  delay(5000);
  setup_wifi();
  timer1.set(interval1, mytimer1);
  timer2.set(interval2, mytimer2);
  delay(1000);

}

void setup_wifi() {
     delay(10);
     Serial.println("Menghubungkan
Ke Wifi : ");
     Serial.println(ssid);
     WiFi.begin(ssid, password);

     while (WiFi.status() !=
WL_CONNECTED) {
            connecting_display();
            Serial.println("Menghubu
ngkan...");
     }
     lcd.clear();
     Serial.println("");
     Serial.println("WiFi
Terhubung");
     Serial.println("Alamat IP : ");
     Serial.println(WiFi.localIP());
}

void mytimer1(){
```

```
    sensor_DS18B20();
    sensor_dht11();
    sensor_soil();
    lcd.setCursor(9, 0);
    lcd.print("U>");
    lcd.setCursor(8, 1);
    lcd.print("<T");

}

void mytimer2(){

    kontrol_relay();

}

void loop() {

    while (WiFi.status() !=
WL_CONNECTED) {
        connecting_display();
        Serial.println("Menghubungka
n...");
    }
    timer1.update();
    timer2.update();

}
```

Sensor Dht11

```
void sensor_dht11() {


    get_dht11 =
read_dht(temperature, humidity, 4,
DHT11);

    firebase.setInt("sensor/dht11_hu
midity", humidity);   // Kirim Data
Ke Firebase
    firebase.setInt("sensor/dht11_su
hu", temperature);   // Kirim Data
Ke Firebase
    lcd.setCursor(12, 0);
    lcd.print("   ");
    lcd.setCursor(12, 0);
    lcd.print(temperature,0);
    lcd.setCursor(15,0);
    lcd.print("C");
    lcd.setCursor(12, 1);
    lcd.print("   ");
    lcd.setCursor(12, 1);
    lcd.print(humidity,0);
    lcd.setCursor(15, 1);
    lcd.print("%");

}
```

Sensor DS18B20

```
void sensor_DS18B20() {

  DS18B20.requestTemperatures(); //
Send the command to get temperatures
  suhu = DS18B20.getTempCByIndex(0);

  firebase.setInt("sensor/ds18b20",
suhu);   // Kirim Data Ke Firebase

  lcd.setCursor(3,0);
  lcd.print("    ");
  lcd.setCursor(3,0);
  lcd.print(suhu,0);
  lcd.setCursor(6, 0);
  lcd.print("C");

}
```

LCD display

```
byte nol02[] = { B00111, B01111,
B11111, B11100, B11100, B11100,
B11100, B11100 };
byte nol03[] = { B11100, B11110,
B11111, B00111, B00111, B00111,
B00111, B00111 };
```

```
byte nol04[] = { B11100, B11100,
B11100, B11100, B11100, B11111,
B01111, B00111 };
byte nol05[] = { B00111, B00111,
B00111, B00111, B00111, B11111,
B11110, B11100 };

byte satu12[] = { B00001, B00011,
B00111, B01111, B11111, B11111,
B00001, B00001 };
byte satu13[] = { B11000, B11000,
B11000, B11000, B11000, B11000,
B11000, B11000 };
byte satu14[] = { B00001, B00001,
B00001, B00001, B00001, B11111,
B11111, B11111 };
byte satu15[] = { B11000, B11000,
B11000, B11000, B11000, B11111,
B11111, B11111 };

byte namexx1[] = { B00111, B01111,
B11111, B11100, B11100, B11100,
B11100, B11100 };
byte namexx2[] = { B11100, B11110,
B11111, B00111, B00111, B00111,
B00111, B00111 };
byte namexx3[] = { B11100, B11100,
B11100, B11110, B11110, B11111,
B11111, B11101 };
byte namexx4[] = { B00111, B00111,
B00111, B00111, B00111, B00111,
B00111, B10111 };
byte namexx5[] = { B11100, B11100,
B11100, B11100, B11100, B11111,
B01111, B00111 };
byte namexx6[] = { B00111, B00111,
B00111, B00111, B00111, B11111,
B11110, B11100 };
byte namexx7[] = { B11101, B11100,
B11100, B11100, B11100, B11100,
B11100, B11100 };
byte namexx8[] = { B10111, B11111,
B11111, B01111, B01111, B00111,
B00111, B00111 };
```

```
void nol(){

  lcd.createChar(1, nol02);
  lcd.write(1);

  lcd.createChar(2, nol03);
  lcd.setCursor(1, 0);
  lcd.write(2);

  lcd.createChar(3, nol04);
  lcd.setCursor(0, 1);
  lcd.write(3);

  lcd.createChar(4, nol05);
  lcd.setCursor(1, 1);
  lcd.write(4);
}

void satu(){

  lcd.createChar(1, satu12);
  lcd.write(1);

  lcd.createChar(2, satu13);
  lcd.setCursor(1, 0);
  lcd.write(2);

  lcd.createChar(3, satu14);
  lcd.setCursor(0, 1);
  lcd.write(3);

  lcd.createChar(4, satu15);
  lcd.setCursor(1, 1);
  lcd.write(4);
}

void connecting_display(){
  lcd.clear();
  lcd.displayOff();
  delay(500);

  lcd.setCursor(0, 0);
  lcd.print("     Wi-Fi      ");
  lcd.setCursor(0, 1);
  lcd.print("<<<<<<<<>>>>>>>>");
```

```
  delay(100);
  lcd.display();
  delay(500);
  lcd.clear();
}

void power_on(){

  lcd.createChar(0, namexx1);
  lcd.setCursor(5, 0);
  lcd.write(0);
  delay(100);

  lcd.createChar(1, namexx2);
  lcd.setCursor(6, 0);
  lcd.write(1);
  delay(100);

  lcd.createChar(2, namexx3);
  lcd.setCursor(8, 0);
  lcd.write(2);
  delay(100);

  lcd.createChar(3, namexx4);
  lcd.setCursor(9, 0);
  lcd.write(3);
  delay(100);

  lcd.createChar(4, namexx5);
  lcd.setCursor(5, 1);
  lcd.write(4);
  delay(100);

  lcd.createChar(5, namexx6);
  lcd.setCursor(6, 1);
  lcd.write(5);
  delay(100);

  lcd.createChar(6, namexx7);
  lcd.setCursor(8, 1);
  lcd.write(6);
  delay(100);

  lcd.createChar(7,
namexx8);  lcd.setCursor(9, 1);
  lcd.write(7);
  delay(100);

}
```

Relay

```
void kontrol_relay (){

  data1 =
firebase.getString("sensor/relay");
  Serial.print("Received
String:\t");
  if(data1 == "1"){
    digitalWrite(relay_pin, HIGH);
    satu();
  }
  else{
    digitalWrite(relay_pin, LOW);
    nol();
  }
  Serial.print("Relay : ");
  Serial.println(data1);

}
```

Soil Moisture

```
void sensor_soil(){

   int data_adc = analogRead(33);
   soil_moist = map(data_adc, 1700,
3200, 100, 0);
   firebase.setInt("sensor/soil",
soil_moist);   // Kirim Data Ke
Firebase
   Serial.println(soil_moist);
   lcd.setCursor(3, 1);
   lcd.print("   ");
   lcd.setCursor(3, 1);
   lcd.print(soil_moist);
   lcd.setCursor(6, 1);
   lcd.print("%");}
```