

LAMPIRAN

Dokumentasi penelitian



Sketch Lengkap

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/*****

* ESP32 + PH + Soil + BMP280
* + Blynk + LCD I2C

*****/

// ===== BLYNK =====
#define BLYNK_TEMPLATE_ID "TMPL68T7ved_i"
#define BLYNK_TEMPLATE_NAME "Soil Monitoring "
#define BLYNK_AUTH_TOKEN "dhum8Q2_uD-99BhVE64J1zEZUiB6BTRg"

#include <WiFi.h>
#include <BlynkSimpleEsp32.h>

// ===== SENSOR =====
#include <Wire.h>
#include <Adafruit_Sensor.h>
#include <Adafruit_BMP280.h>

Adafruit_BMP280 bmp;

// ===== LCD =====
#include <LiquidCrystal_I2C.h>
LiquidCrystal_I2C lcd(0x27,16,2);

// ===== WIFI =====
char ssid[] = "001";
char pass[] = "1spasi23";

// ===== PIN =====

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#define DMSpin 13
#define indikator 2
#define adcPin 34
#define soilPin 35

// ===== VARIABEL =====
int ADC;
float lastReading;
float pH;

int soilValue;
float soilPercent;

float temperature;

// ===== SETUP =====
void setup(){

Serial.begin(115200);
Serial.println("Mulai Program...");

analogReadResolution(10);

pinMode(DMSpin, OUTPUT);
pinMode(indikator, OUTPUT);

digitalWrite(DMSpin,HIGH);

Wire.begin(21,22);

// ===== LCD =====
lcd.init();
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lcd.backlight();

lcd.setCursor(0,0);
lcd.print("SOIL MONITOR");
lcd.setCursor(0,1);
lcd.print("Starting...");
delay(2000);

// ===== BMP280 =====
if(!bmp.begin(0x76)){
Serial.println("BMP280 ERROR!");
}else{
Serial.println("BMP280 OK");
}

// ===== WIFI CONNECT =====
Serial.print("Connecting WiFi");
WiFi.begin(ssid, pass);

while (WiFi.status() != WL_CONNECTED) {
delay(500);
Serial.print(".");
}
Serial.println(" WIFI CONNECTED");

// ===== BLYNK CONNECT =====
Blynk.config(BLYNK_AUTH_TOKEN);

if (Blynk.connect()) {
Serial.println("Blynk Connected");
} else {
Serial.println("Blynk Gagal Connect");
```

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}  
  
}  
  
// ===== ANIMASI BLOK =====  
void animasiSensor(){  
  
  lcd.clear();  
  lcd.setCursor(0,0);  
  lcd.print("Reading Sensor");  
  
  for(int i=0;i<16;i++){  
  
    lcd.setCursor(i,1);  
    lcd.write(255); // blok  
  
    delay(200);  
  
  }  
  
}  
  
// ===== LOOP =====  
void loop(){  
  
  Blynk.run();  
  
  // ===== ANIMASI =====  
  animasiSensor();  
  
  Serial.println("Mulai baca sensor...");
```

```
// ===== PH TANAH =====  
digitalWrite(DMSpin,LOW);  
digitalWrite(indikator, HIGH);  
  
delay(10000);  
  
ADC = analogRead(adcPin);  
  
pH = (-0.0233 * ADC) + 12.698;  
  
if (pH != lastReading){  
  lastReading = pH;  
}  
  
if(lastReading > 14.0){  
  lastReading = 0.0;  
}  
  
digitalWrite(DMSpin,HIGH);  
digitalWrite(indikator,LOW);  
  
// ===== SOIL =====  
soilValue = analogRead(soilPin);  
soilPercent = map(soilValue,1023,0,0,100);  
  
// ===== SUHU =====  
temperature = bmp.readTemperature();  
  
// ===== SERIAL =====  
Serial.print("ADC=");  
Serial.print(ADC);  
Serial.print(" pH=");
```

```
Serial.println(lastReading,1);

Serial.print("Soil=");
Serial.print(soilPercent);
Serial.println("%");

Serial.print("Temp=");
Serial.println(temperature);

// ===== LCD =====
lcd.clear();

// kiri atas → pH
lcd.setCursor(0,0);
lcd.print("pH:");
lcd.print(lastReading,1);

// kanan atas → suhu
lcd.setCursor(10,0);
lcd.print("T:");
lcd.print(temperature,1);
lcd.print("C");

// bawah tengah → soil
lcd.setCursor(3,1);
lcd.print("Soil:");
lcd.print(soilPercent,0);
lcd.print("%");

// ===== BLYNK =====
Blynk.virtualWrite(V0,lastReading);
Blynk.virtualWrite(V1,soilPercent);
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Blynk.virtualWrite(V2,temperature);
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// tampil 5 detik
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delay(5000);
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}
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