

LAMPIRAN

```
#include <WiFi.h>
#include <FirebaseESP32.h>
#include <ArduinoJson.h>
#include <WiFiClient.h>
#include <Wire.h>
#include <LiquidCrystal_I2C.h> //Library LCD I2C
LiquidCrystal_I2C lcd(0x27, 20, 4); //Alamat I2C

#define FIREBASE_HOST "https://monitoring-kualitas-lingkungan-default-
rtdb.firebaseio.com/"
#define FIREBASE_AUTH "2gnKxQhOUJwKnPwj1rkmQuFDyWkLhvdpWz74PUj5"

#define WIFI_SSID "iPhone"
#define WIFI_PASSWORD "qwerty007."

const int ph_Pin=A0; //Deklarasi sensor terhubung pada pin pH

int kekeruhan = 32; //Deklarasi sensor terhubung pada pin Turbidity
#define sensorPin 33 //Deklarasi sensor terhubung pada pin Co
#define sensorPin1 34 //Deklarasi sensor terhubung pada pin NO2
#define sensorPin2 35 //Deklarasi sensor terhubung pada pin NH3

const int bawah=0;
const int atas=4095;
const int Db=0;
const int Da=4095;
const int Db1=0;
const int Da1=4095;
int range,range1,range2;

float Po = 0;
```

```
float PH_step;
int nilai_analog_PH;
double TeganganPh;
//untuk kalibrasi
float PH4 = 3.154;
float PH7 = 2.679;

String info="";
String infoStatusPH="";
String infoStatusGAS="";
//Define FirebaseESP32 data object
FirebaseData firebaseData;
FirebaseJson json;
FirebaseData ledData;

void setup()
{
  Serial.begin(115200);
  lcd.init(); //Mulai LCD
  lcd.backlight(); //Nyalakan backlight

  pinMode(ph_Pin,INPUT);
  Serial.println("Setup initializing");
  WiFi.begin(WIFI_SSID, WIFI_PASSWORD);
  Serial.print("Connecting to Wi-Fi");
  while (WiFi.status() != WL_CONNECTED)
  {
    Serial.print(".");
    delay(300);
  }
}
```

```
Serial.println();  
Serial.print("Connected with IP: ");  
Serial.println(WiFi.localIP());  
Serial.println();  
  
Firebase.begin(FIREBASE_HOST, FIREBASE_AUTH);  
Firebase.reconnectWiFi(true);  
Firebase.setReadTimeout(firebaseData, 1000 * 60);  
Firebase.setwriteSizeLimit(firebaseData, "tiny");
```

```
Serial.println("-----");  
Serial.println("Connected...");  
}
```

```
void loop()  
{  
int CO=analogRead(sensorPin);  
range=map(CO,bawah,atas,0,1000);  
int hasil=range/10;  
int NO2=analogRead(sensorPin1);  
range1=map(NO2,Db,Da,0,10);  
int NH3=analogRead(sensorPin2);  
range2=map(NH3,Db1,Da1,0,500);  
int no=range2/100;  
int hasil2=range2/10;  
  
Serial.print("CO: ");  
Serial.println(range);  
Serial.print("NO2 : ");
```

```

Serial.println(no);
Serial.print("NH3 : ");
Serial.println(range2);

int sensorValue = analogRead(kekeruhan);
int turbidity = map(sensorValue, 0, 750, 100, 0);
int ntu = turbidity +351;

nilai_analog_PH = analogRead(ph_Pin);
Serial.print("Nilai ADC Ph: ");
Serial.println(nilai_analog_PH);
TeganganPh = 3 / 4095.0 * nilai_analog_PH;
Serial.print("TeganganPh: ");
Serial.println(TeganganPh, 3);

PH_step = (PH4 - PH7) / 3;
Po = 7.00 + ((PH7 - TeganganPh) / PH_step); //Po = 7.00 + ((teganganPh7 - TeganganPh)
/ PhStep);
Serial.print("Nilai PH cairan: ");
Serial.println(Po, 2);

if(ntu<0){
  ntu= 0;
}
/*Serial.print(turbidity);
Serial.print(Value);
Serial.print(" | ");
Serial.println(ph);
Serial.println(sensorValue);
*/lcd.clear();
lcd.setCursor(0, 0);

```

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

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

```
lcd.setCursor(10, 0);
```

```
lcd.print(ntu);
```

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

```
lcd.print("pH Air =");
```

```
lcd.print(Po);
```

```
lcd.setCursor(0,2);
```

```
lcd.print("CO=");
```

```
lcd.print(hasil);
```

```
lcd.setCursor(10,2);
```

```
lcd.print("No2=");
```

```
lcd.print(no);
```

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

```
lcd.print("NH3=");
```

```
lcd.print(hasil2);
```

```
if (ntu < 25) {
```

```
    lcd.setCursor(14, 0);
```

```
    lcd.print("bersih");
```

```
    //Serial.print(" air Jernih ");
```

```
info= "bersih";
```

```
}
```

```
if ((ntu > 25) && (turbidity < 50)) {
```

```
    lcd.setCursor(14, 0);
```

```
    lcd.print("keruh ");
    info= "keruh";
    // Serial.print(" its CLOUDY ");
}
if (ntu > 50) {

    lcd.setCursor(14, 0);
    lcd.print("kotor ");
    info= "kotor";
    // Serial.print(" its DIRTY ");
}

//-----PH-----
if (Po < 7) {

    lcd.setCursor(14, 1);
    lcd.print("ASAM");
    //Serial.print(" air Jernih ");
    infoStatusPH= "ASAM";

}

if ((Po > 7) && (Po < 8)) {

    lcd.setCursor(14, 1);
    lcd.print("NETRAL");
    infoStatusPH= "NETRAL";
    // Serial.print(" its CLOUDY ");
}

if (Po > 8) {

    lcd.setCursor(14, 1);
```

```

    lcd.print("BASAH");
    infoStatusPH= "BASAH";
    // Serial.print(" its DIRTY ");
}

//-----GAS-----

if (hasil <= 25) {

    lcd.setCursor(8, 3);
    lcd.print("NORMAL ");
    //Serial.print(" air Jernih ");
infoStatusGAS= "NORMAL";

}

if ((hasil >= 25) && (hasil <= 40)) {

    lcd.setCursor(8,3);
    lcd.print("MENINGKAT");
    infoStatusGAS= "MENINGKAT";
    Serial.print(" its CLOUDY ");
}

if (hasil >= 40) {

    lcd.setCursor(8, 3);
    lcd.print("BAHAYA ");
    infoStatusGAS= "BAHAYA";
    // Serial.print(" its DIRTY ");
}

```



```

//----- send data to blynk -----
json.set("/pH", Po);
Firebase.updateNode(firebaseData,"/FirebasePWI",json);
json.set("/Kekeruhan", ntu);
Firebase.updateNode(firebaseData,"/FirebasePWI",json);
json.set("/Co", hasil);
Firebase.updateNode(firebaseData,"/FirebasePWI",json);
json.set("/NO2", no);
Firebase.updateNode(firebaseData,"/FirebasePWI",json);
json.set("/NH3", hasil2);
Firebase.updateNode(firebaseData,"/FirebasePWI",json);
json.set("/status", info);
Firebase.updateNode(firebaseData,"/FirebasePWI",json);
json.set("/statusPH", infoStatusPH);
Firebase.updateNode(firebaseData,"/FirebasePWI",json);
json.set("/statusGAS",infoStatusGAS);
Firebase.updateNode(firebaseData,"/FirebasePWI",json);
    delay(500);
}

```

```

float round_to_dp( float in_value, int decimal_place )
{
    float multiplier = powf( 10.0f, decimal_place );
    in_value = roundf( in_value * multiplier ) / multiplier;
    return in_value;
}

```