

LAMPIRAN

1. Surat Observasi
2. Observasi di Aquarium Family



3. Pengujian di Aquarium Family



4. Code Aplikasi
https://drive.google.com/drive/folders/1QfUByPfi4Z1GzcOLtD8o9H1K0-WZboSs?usp=drive_link
5. Code Alat
https://drive.google.com/drive/folders/1J62vOfpYBQ5YDxoe8zUA-FS7ewl4ayeu?usp=drive_link

6. Tutorial alat dan aplikasi

<https://drive.google.com/drive/folders/1W6IDmFOIHm34rWs3w1Xc5E3VmVBCXFek?usp=sharing>

7. Code Tambahan

```
//library
#include <ESP8266WiFi.h>
#include <time.h>
#include <LiquidCrystal_I2C.h>
#include <Servo.h>
#include <FirebaseArduino.h>

// Pin analog sensor turbidity terhubung ke A0
int sensorPin = A0;
int sensorValue = 0; // Variabel untuk menyimpan nilai ADC dari
sensor
float voltage = 0;    // Variabel untuk menyimpan tegangan
float NTU = 0;        // Variabel untuk menyimpan nilai NTU

#define FIREBASE_HOST "skripsidiah-bfb75-default-
rtadb.firebaseio.com"
#define FIREBASE_AUTH
"i9jhoPwLMAXE5VYOWuGcSO0OLJKxw838V9l6b9v5"

//library
Servo servoKu;
LiquidCrystal_I2C lcd(0x27, 16, 2);
int timezone = 7 * 3600;
int dst = 0;

//koneksi internet nodemcu
const char* ssid = "RedmiNote12";
const char* password = "jungkook";

#define sensor A0
#define relay1 D5
#define relay2 D6

void setup() {
  pinMode(relay1, OUTPUT);
  pinMode(relay2, OUTPUT);

  //library
  servoKu.attach(D4);
  servoKu.write (0);
  Firebase.begin(FIREBASE_HOST, FIREBASE_AUTH);

  //menampilkan di serial monitor
```

```

Serial.begin(115200);
Serial.println();
Serial.print("Wifi connecting to ");
Serial.println(ssid);
WiFi.begin(ssid, password);
Serial.println();
Serial.print("Connecting");
lcd.print("connecting");
while ( WiFi.status() != WL_CONNECTED ) {
    delay(500);
    Serial.print(".");
    lcd.print (".");
}
lcd.clear();
Serial.println();
Serial.println("Wifi Connected Success!");
Serial.print("NodeMCU IP Address : ");
Serial.println(WiFi.localIP());

//library mengambil data waktu
configTime(timezone, dst, "pool.ntp.org", "time.nist.gov");
Serial.println("\nWaiting for Internet time");
while (!time(nullptr)) {
    Serial.print("*");
    delay(1000);
}
Serial.println("\nTime response....OK");
}

void loop() {
    lcd.begin();
    sensorValue = analogRead(sensorPin);

    // Konversi nilai ADC (0-1023) menjadi tegangan (0-3.3V)
    voltage = sensorValue * (3.3 / 1023.0);

    if (voltage < 2.5) {
        // Tegangan rendah (kekeruhan tinggi)
        NTU = 100 * (2.5 - voltage); // Misal: nilai maksimal NTU adalah
3000
    } else {
        NTU = 0; // Jika tegangan terlalu tinggi, air sangat bersih
    }

    // Menampilkan nilai ADC, tegangan, dan NTU ke serial monitor
    Serial.print("Nilai ADC: ");
    Serial.print(sensorValue);
    Serial.print("\tTegangan: ");

```

```

Serial.print(voltage);
Serial.print(" \tNTU: ");
Serial.print(NTU);
Serial.println(" NTU");

//buat menguras aqauarium jika kotor (jika tegangan tnggi = air bersih
semakin kecil nilai semakin bersih )
if (NTU > 75) {
    digitalWrite(relay1, HIGH); // Aktifkan relay (lampu)
    digitalWrite(relay2, HIGH); // Aktifkan relay (lampu)
} else {
    digitalWrite(relay1, LOW); // Aktifkan relay (lampu)
    digitalWrite(relay2, LOW); // Aktifkan relay (lampu)
}

//memasukan nilai NTU ke firebase
Firebase.setInt("/akuarium2", sensorValue);

//ambil data waktu library ntp
time_t now = time(nullptr);
struct tm* p_tm = localtime(&now);
int hari = p_tm->tm_mday;
int jam = p_tm->tm_hour;
int menit = p_tm->tm_min;
int detik = p_tm->tm_sec;

//menampilkan waktu serial monitor
Serial.print(jam);
Serial.print(":");
Serial.print (menit);
Serial.print(":");
Serial.println(detik);

//tampil lcd
lcd.print(jam);
lcd.print(":");
lcd.print(menit);
lcd.print(":");
lcd.print(detik);

//tampil kekeruhan ke lcd
lcd.setCursor(0, 1);
lcd.print("Kekeruhan:");
lcd.print(sensorValue);

// Setting waktu pakan keluar
if ( (p_tm->tm_hour == 7) && (p_tm->tm_min == 1)) {
    Serial.println("Ikan Makan");
    servoKu.write (180);
}

```

```
if ( (p_tm->tm_hour == 17) && (p_tm->tm_min == 2)) {  
    Serial.println("Ikan Makan");  
    servoKu.write (0);  
}  
  
}
```