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LAMPIRAN A

Program Arduino

```
//LIBRARY
#include <WiFi.h>
#include <PubSubClient.h>
#include <Wire.h>
#include <DHT.h>
#include <NTPClient.h>
#include <WiFiUdp.h>

//PIN
#define SMOKE_DETECTOR_PIN    21
#define SMOKE_DETECTOR_RESET_PIN 19 // Relay 1 pin
#define CO2_PIN                18 // Relay 2 pin
#define DHT22_PIN              15
#define BUZZER_PIN             4 //
#define DHTTYPE DHT22
#define RELAY_ON 0
#define RELAY_OFF 1
const int ledPin = 4;
//const int fire_detector[] = {13,12,14,27,26,25,33,32,20};
const int fire_pin_total = 4;
const int fire_detector[] = {13,14,27,26};

//WIFI
char* ssid = "DEMONS DAMN";
char* password = "111qqqq";

//MQTT
const char* mqtt_server = "broker.hivemq.com";
const char* tempTopic = "EWS-fadhlan/temperature";
const char* humTopic = "EWS-fadhlan/humidity";
const char* fireTopic = "EWS-fadhlan/fire";
const char* smokeTopic = "EWS-fadhlan/smoke";
const char* alertTopic = "EWS-fadhlan/alert";

//OBJEK LIBRARY
WiFiClient espClient;
```

```
PubSubClient client(espClient);
DHT dht(DHT22_PIN, DHTTYPE);
WiFiUDP ntpUDP;
NTPCClient timeClient(ntpUDP, "id.pool.ntp.org");
```

```
//////////////////// VARIABEL //////////////////////
```

```
long lastMsg = 0;
char msg[50];
int temperature;
int humidity;
int a;
float t;
float h;
float tempLimit= 40.00;
int prev_fire_state = 0; int fire_state = 0; int fire_limit = 4;
bool sele_state= false;
bool smoke_state = false; int smoke_count = 0; int
smoke_duration = 2;
bool tlgrm_state = false;
unsigned int selenoid_count = 0;
unsigned int selenoid_duration = 7;
bool fire_tlgrm=false; bool smoke_tlgrm=false; bool
temp_tlgrm=false;
```

```
//////////////////// VARIABEL WAKTU //////////////////////
```

```
unsigned long log_check=0; unsigned long log_intrvl=1000;
unsigned long fire_check=0; unsigned long fire_intrvl=1000;
unsigned long smoke_check=0; unsigned long
smoke_intrvl=1000;
```

```
void setup_wifi(); void callback(char* topic, byte* message,
unsigned int length); void reconnect(); void fireDetecting(); void
smokeDetecting(); void measureTempHum(); void
pushNotification(); void publishData(); void alarmBlaring();
void alarmReset();
```

```
void setup() {
  Serial.begin(9600);
```

```

dht.begin();
for(int i=0; i<fire_pin_total; i++){
  pinMode(fire_detector[i], INPUT);
}
pinMode(SMOKE_DETECTOR_PIN, INPUT);
pinMode(SMOKE_DETECTOR_RESET_PIN, OUTPUT);
pinMode(CO2_PIN, OUTPUT);
pinMode(BUZZER_PIN, OUTPUT);
digitalWrite(BUZZER_PIN,LOW);

digitalWrite(SMOKE_DETECTOR_RESET_PIN,RELAY_ON
);
  delay(500);
digitalWrite(SMOKE_DETECTOR_RESET_PIN,RELAY_OF
F);
digitalWrite(CO2_PIN,RELAY_OFF);
setup_wifi();
client.setServer(mqtt_server, 1883);
// client.setCallback(callback);
pinMode(ledPin, OUTPUT);

timeClient.begin();
timeClient.forceUpdate();
}

void loop() {
  //reconnect wifi
  if (!client.connected()) { //RECONNECT MQTT
    reconnect();
  }
  client.loop(); //MQTT
  if(Serial.available()) //INPUT KEYBOARD
  {
    switch(Serial.read()) // akhiri setiap perintah
    dengan ';' contoh "s1000;"
    {
      case 's': //CEK SENSOR API
        a =Serial.parseInt();
        Serial.println("fire sensor channel");

```

```

for(int i=0;i<fire_pin_total;i++){
    Serial.print(i);
    Serial.print(' ');
}
Serial.println();
for(int i=0;i<fire_pin_total;i++){
    Serial.print(digitalRead(fire_detector[i]));
    Serial.print(' ');
}
Serial.println();
break;

case 'a': //CEK DHT
    h = dht.readHumidity();
    Serial.print("humidity : ");
    Serial.println(h);
    t = dht.readTemperature();
    Serial.print("  Tempertature : ");
    Serial.println(t);
    break;

case 'b': //Smoke detector atau Selenoid switch MATI
    a = Serial.parseInt();
    Serial.print("Relay deactivate");
    if(a==1){
        digitalWrite(SMOKE_DETECTOR_RESET_PIN,
RELAY_OFF);
        Serial.println(" ch1 (smoke detector reset)");
    }else if(a==2){
        digitalWrite(CO2_PIN, RELAY_OFF);
        Serial.println(" ch2 (CO2)");
    }
    break;

case 'c': //Smoke detector atau Selenoid switch NYALA
    a = Serial.parseInt();
    Serial.print("Relay activate");
    if(a==1){

```



```

        digitalWrite(SMOKE_DETECTOR_RESET_PIN,
RELAY_ON);
        Serial.println(" ch1 (smoke detector reset)");
    }else if(a==2){
        digitalWrite(CO2_PIN, RELAY_ON);
        Serial.println(" ch2 (CO2)");
    }
    break;

case 'd': //Smoke detector status
    Serial.print("Smoke detector status");
    Serial.println(digitalRead(SMOKE_DETECTOR_PIN));
    break;

case 'e': //NYALAKAN BUZZER SEBENTAR
    Serial.println("Change buzzer status");
    digitalWrite(BUZZER_PIN,
!(digitalRead(BUZZER_PIN)));
    break;
}
}
if(millis()-fire_check > fire_intrvl ){ //CEK SENSOR API
TIAP DETIK
    fire_check = millis();
    if(sele_state != true){ //JIKA VALVE CO2 KONDISI
TIDAK NYALA
        prev_fire_state = fire_state;
        for(int i=0; i< fire_pin_total; i++){ //CEK SENSOR API
            if(digitalRead(fire_detector[i]) == false){ //KALAU ADA
API
                fire_state+=1;
                if(fire_state == fire_limit){ //JIKA SENSOR API
MENYALA 2 DETIK
                    if(fire_tlgrm != true){ //KIRIM TELEGRAM API
                        fire_tlgrm = true;
                        client.publish(alertTopic, "Alert! Your device detected
a fire!");
                    }
}
}
}
}

```

```

    }
    Serial.print("Fire detected "); Serial.println(fire_state);
delay(10);
    break;
    }
}
if(prev_fire_state == fire_state){ //JIKA SENSOR API
TIDAK MENYALA LAGI
    fire_state = 0;
}
if((fire_state!=0) && (fire_state%fire_limit == 0)){ //JIKA
SENSOR API LEBIH DARI 2 DETIK
    sele_state = true;
}
}
else{ //JIKA VALVE CO2 KONDISI NYALA
digitalWrite(CO2_PIN,RELAY_ON); // VALVE NYALA
digitalWrite(BUZZER_PIN, HIGH); // BUZZER NYALA
solenoid_count+=1;
Serial.print("Solenoid active for ");
Serial.print(solenoid_count-1); Serial.println(" second");
if(solenoid_count > solenoid_duration){
digitalWrite(CO2_PIN,RELAY_OFF); //VALVE MATI
digitalWrite(BUZZER_PIN,LOW); //BUZZER MATI
solenoid_count=0;
sele_state = false;
}
}
}
if(millis()-smoke_check > smoke_intrvl){ //CEK SENSOR
ASAP
    smoke_check = millis();
    if(smoke_state != true){ //JIKA TIDAK TERDETEKSI
ASAP
        if(digitalRead(SMOKE_DETECTOR_PIN) == LOW){
            Serial.println("Smoke detected");
            smoke_state = true;
        }
        else{

```

```

        smoke_tlgrm = false;
    }
}
else{ //JIKA ASAP TERDETEKSI
    if(smoke_tlgrm !=true){ //KIRIM PERINGATAN
TELEGRAM ASAP
        smoke_tlgrm = true;
        client.publish(alertTopic, "Alert! Your device detected a
smoke!");
    }
    if(smoke_count==0){
        digitalWrite(BUZZER_PIN,HIGH); //BUZZER NYALA
    }
    smoke_count+=1;
    if(smoke_count > smoke_duration){ //JIKA ASAP NYALA
LEBIH DARI 2 DETIK
        smoke_count=0;
        smoke_state=false;
        digitalWrite(BUZZER_PIN,LOW); //BUZZER MATI
        //RESET SMOKE DETECTOR

digitalWrite(SMOKE_DETECTOR_RESET_PIN,RELAY_ON
);delay(1000);

digitalWrite(SMOKE_DETECTOR_RESET_PIN,RELAY_OF
F);
    }
}
}
if(millis()-log_check > log_intrvl){ //KIRIM DATA KE
MQTT TIAP DETIK
    timeClient.forceUpdate();
    log_check = millis();
    //BACA DHT
    h= dht.readHumidity();
    t= dht.readTemperature();
    char tempArr[6];
    char humArr[6];
    char fireArr[2];

```

```

char smokeArr[2];
dtostrf(dht.readHumidity(),1,2,humArr);
dtostrf(dht.readTemperature(),1,2,tempArr);
itoa((fire_state/10),fireArr,10);
itoa(smoke_state,smokeArr,10);
client.publish(tempTopic, ((char*)tempArr));
client.publish(humTopic, ((char*)humArr));
client.publish(fireTopic, (char*)fireArr);
client.publish(smokeTopic,(char*)smokeArr);
if(t>tempLimit){ //JIKA SUHU LEBIH TINGGI DARI
BATAS 40
    if(temp_tlgrm != true){
        Serial.println("High temp");
        digitalWrite(BUZZER_PIN,HIGH); //BUZZER NYALA
        temp_tlgrm=true;
        char alertArr[80];
        sprintf(alertArr,"Alert! High temperature of %s Celcius has
been detected by your device \0", (char*)tempArr);
        client.publish(alertTopic,(char*)alertArr); //KIRIM
TELEGRAM SUHU
    }
}
else{ //JIKA SUHU DIBAWAH BATAS
    temp_tlgrm = false;
    digitalWrite(BUZZER_PIN,LOW); //BUZZER MATI
}
}
}

```

```

void setup_wifi() { //PENGATURAN CONNECT WIFI
    delay(10);
    // We start by connecting to a WiFi network
    Serial.println();
    Serial.print("Connecting to ");
    Serial.println(ssid);

    WiFi.begin(ssid, password);

```

```

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

Serial.println("");
Serial.println("WiFi connected");
Serial.println("IP address: ");
Serial.println(WiFi.localIP());
}

void reconnect() { //RECONNECT MQTT
// Loop until we're reconnected
while (!client.connected()) {
  // Serial.print("Attempting MQTT connection...");
  // Attempt to connect
  if (client.connect("EWS - Fire Alarm")) {
    Serial.println("connected to mqtt");
    client.subscribe("EWS/esp32/output");
  } else {
    Serial.print("failed, rc=");
    Serial.print(client.state());
    Serial.println(" try again in 5 seconds");
    // Wait 5 seconds before retrying
    delay(5000);
  }
}
}
}

```


LAMPIRAN B
Dokumentasi Kegiatan



BIODATA PENULIS



Nama : Fadhlani Aldi Rizqullah
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Alamat : Perum Taman Juanda, Blok A-2
Email : fadhlanald6969@gmail.com
Telepon/HP : 0815-777-3618
Hobi : Berenang
Motto : To live is to suffer, to survive is to find some meaning in the suffering

Riwayat Pendidikan :

Sekolah	Jurusan	Periode
SD Negeri Kampus Petungan Sidakaya 03 Cilacap	-	2007 - 2013
SMP Negeri 1 Cilacap	-	2013 - 2016
SMK Swasta Telkom Sandhy Putra Purwokerto	Teknik Telekomunikasi	2016 - 2019
Politeknik Negeri Cilacap	Teknik Elektronika	2019 - 2022

Penulis telah mengikuti seminar Tugas Akhir pada tanggal 9 Agustus 2022 sebagai salah satu persyaratan untuk memperoleh gelar Ahli Madya (A.Md).