

## LAMPIRAN

### Lampiran A. Kode Program

```
1 #define BLYNK_TEMPLATE_ID "TMPL6t_17eGcb"
2 #define BLYNK_TEMPLATE_NAME "DETEKSI KEBAKARAN"
3 #define BLYNK_AUTH_TOKEN "ZWxm_-i97MDpWHLm_fh5iwNwXC3Kqu3_"
4
5 #include <BlynkSimpleEsp32.h>
6 #include <LiquidCrystal_I2C.h>
7 #include "Wire.h"
8 #include <DHT.h>
9 #include <math.h>
10 #include <WiFi.h>
11
12 #define MQ2_PIN 35
13 #define LED_DANGER 15
14 #define LED_HIJAU 12
15 #define LED_MERAH 14
16 #define BUZZER_PIN 27
17 #define FLAME_SENSOR_PIN 33
18 #define DHT_PIN 26
19 #define DHT_TYPE DHT22
20
21 #define RLOAD_MQ2 10.0
22 #define RZERO_MQ2 10.0
23 #define PARA_MQ2_LPG 116.6020682
24 #define PARB_MQ2_LPG -2.769034857
25 #define PARA_MQ2_ASAP 70.0
26 #define PARB_MQ2_ASAP -3.0
27
28 LiquidCrystal_I2C lcd(0x27, 20, 4);
29 DHT dht(DHT_PIN, DHT_TYPE);
30
31 char auth[] = BLYNK_AUTH_TOKEN;
32 char ssid[] = "Alif";
33 char pass[] = "213310027";
34
35 BlynkTimer timer;
36 bool blynkConnected = false;
37
38 void playAlarm() {
39   tone(BUZZER_PIN, 1000, 1000);
40 }
41
42 void connectToWiFi() {
43   WiFi.begin(ssid, pass);
```

```
44 unsigned long startAttemptTime = millis();
45 while (WiFi.status() != WL_CONNECTED && millis() -
startAttemptTime < 5000) {
46     delay(500);
47 }
48 }
49
50 void connectToBlynk() {
51 if (WiFi.status() == WL_CONNECTED) {
52     Blynk.begin(auth, ssid, pass);
53     blynkConnected = true;
54 } else {
55     blynkConnected = false;
56 }
57 }
58
59 void sendToBlynk(float temperature, float humidity, float
gasPPM_LPG, float gasPPM_ASAP) {
60     if (blynkConnected) {
61         Blynk.virtualWrite(V0, temperature);
62         Blynk.virtualWrite(V1, humidity);
63         Blynk.virtualWrite(V2, gasPPM_LPG);
64         Blynk.virtualWrite(V3, gasPPM_ASAP);
65         checkTemperatureWarning(temperature);
66     }
67 }
68
69 void checkTemperatureWarning(float temperature) {
70     if (temperature > 38 && blynkConnected) {
71         Blynk.logEvent("suhu_berbahaya", "Suhu di dapur melebihi 38
derajat!");
72     }
73 }
74
75 float readMQ2PPM(float para, float parb) {
76     int mq2Value = analogRead(MQ2_PIN);
77     float vOut = mq2Value * (5.0 / 4095.0);
78     float rSensor = (RLOAD_MQ2 * (5.0 - vOut)) / vOut;
79     float ratio = rSensor / RZERO_MQ2;
80     return para * pow(ratio, parb);
81 }
82
83 void displayLCD(float temperature, float humidity, float
gasPPM_LPG, float gasPPM_ASAP) {
84     lcd.setCursor(0, 0);
85     lcd.print("Temp  :");
86     lcd.print(temperature);
87     lcd.print(" C  ");
```

```
88  lcd.setCursor(0, 1);
89  lcd.print("Hum  :");
90  lcd.print(humidity);
91  lcd.print(" %  ");
92  lcd.setCursor(0, 2);
93  lcd.print("Gas  :");
94  lcd.print(gasPPM_LPG);
95  lcd.print(" ppm ");
96  lcd.setCursor(0, 3);
97  lcd.print("Smoke :");
98  lcd.print(gasPPM_ASAP);
99  lcd.print(" ppm ");
100 }
101
102 void setup() {
103   Serial.begin(115200);
104   lcd.init();
105   lcd.backlight();
106   pinMode(LED_DANGER, OUTPUT);
107   pinMode(LED_HIJAU, OUTPUT);
108   pinMode(LED_MERAH, OUTPUT);
109   pinMode(BUZZER_PIN, OUTPUT);
110   pinMode(FLAME_SENSOR_PIN, INPUT);
111   dht.begin();
112
113   connectToWiFi();
114   connectToBlynk();
115 }
116
117 void loop() {
118   if (WiFi.status() != WL_CONNECTED) {
119     blynkConnected = false;
120     connectToWiFi();
121     connectToBlynk();
122   }
123
124   if (blynkConnected) {
125     Blynk.run();
126   }
127
128   float gasPPM_LPG = readMQ2PPM(PARA_MQ2_LPG, PARB_MQ2_LPG);
129   float gasPPM_ASAP = readMQ2PPM(PARA_MQ2_ASAP,
PARB_MQ2_ASAP);
130   float temperature = dht.readTemperature();
131   float humidity = dht.readHumidity();
132   checkTemperatureWarning(temperature);
133
134   int api = digitalRead(FLAME_SENSOR_PIN);
135   if (api == LOW) {
```

```
136     digitalWrite(LED_DANGER, HIGH);
137     playAlarm();
138     if (blynkConnected) Blynk.logEvent("api", "Api
Terdeteksi!");
139   } else {
140     digitalWrite(LED_DANGER, LOW);
141     digitalWrite(BUZZER_PIN, LOW);
142   }
143
144   if (gasPPM_LPG >= 300 || gasPPM_ASAP >= 300) {
145     if (blynkConnected) Blynk.logEvent("gas_asap", "Terdeteksi
kebocoran gas/asap berlebihan, Berbahaya!");
146     playAlarm();
147     digitalWrite(LED_HIJAU, LOW);
148     digitalWrite(LED_MERAH, HIGH);
149   } else {
150     digitalWrite(LED_HIJAU, HIGH);
151     digitalWrite(LED_MERAH, LOW);
152   }
153
154   displayLCD(temperature, humidity, gasPPM_LPG, gasPPM_ASAP);
155   if (blynkConnected) {
156     sendToBlynk(temperature, humidity, gasPPM_LPG,
gasPPM_ASAP);
157     delay(3000);
158   } else {
159     delay(1000);
160   }
161   lcd.clear();
162 }
```

Lampiran A.1 Kode Program Arduino IDE

## Lampiran B. Keputusan Sidang Tugas Akhir



### KEPUTUSAN HASIL UJIAN PENDADARAN

Sesuai dengan hasil sidang pendadaran pada tanggal 11 Februari 2021 maka

Nama Mahasiswa Mu'alif Ihwan Kurniawan  
 NIM / Program Studi 21330027 / Informatika  
 Jenjang

dinyatakan LULUS

Ketua Penguji Totok Budioko, S.T., M.T.

## Lampiran B.2 Keputusan Hasil Ujian Pendadaran

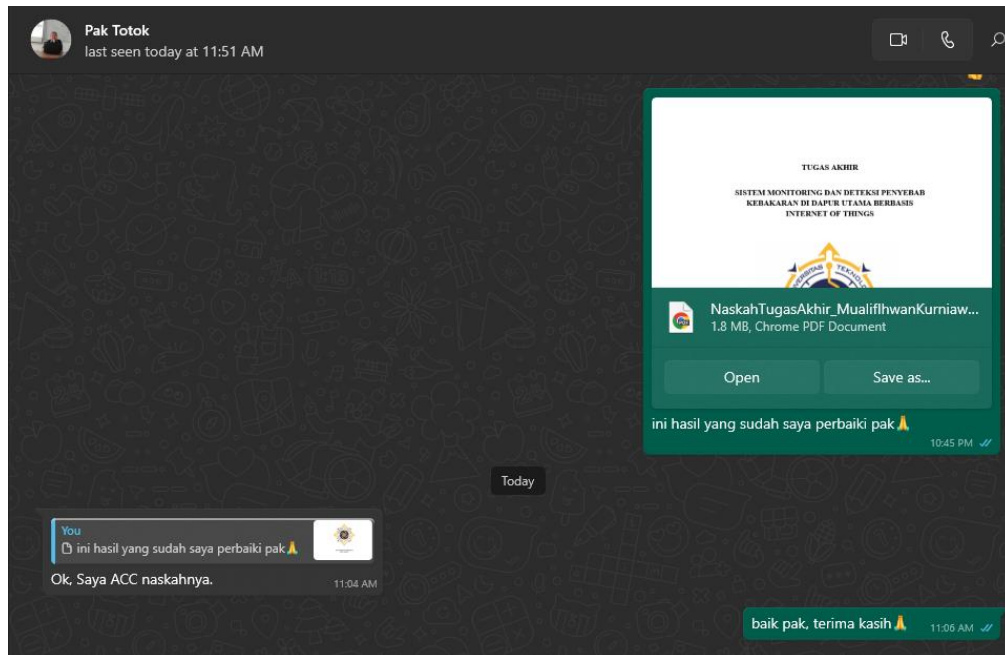


Hari, tanggal : Selasa, 11 Februari 2025  
 Waktu : 14.30  
 Nama : Mu'alif Ihwan Kurniawan  
 No. Mahasiswa / Prodi : 21330027 / Informatika

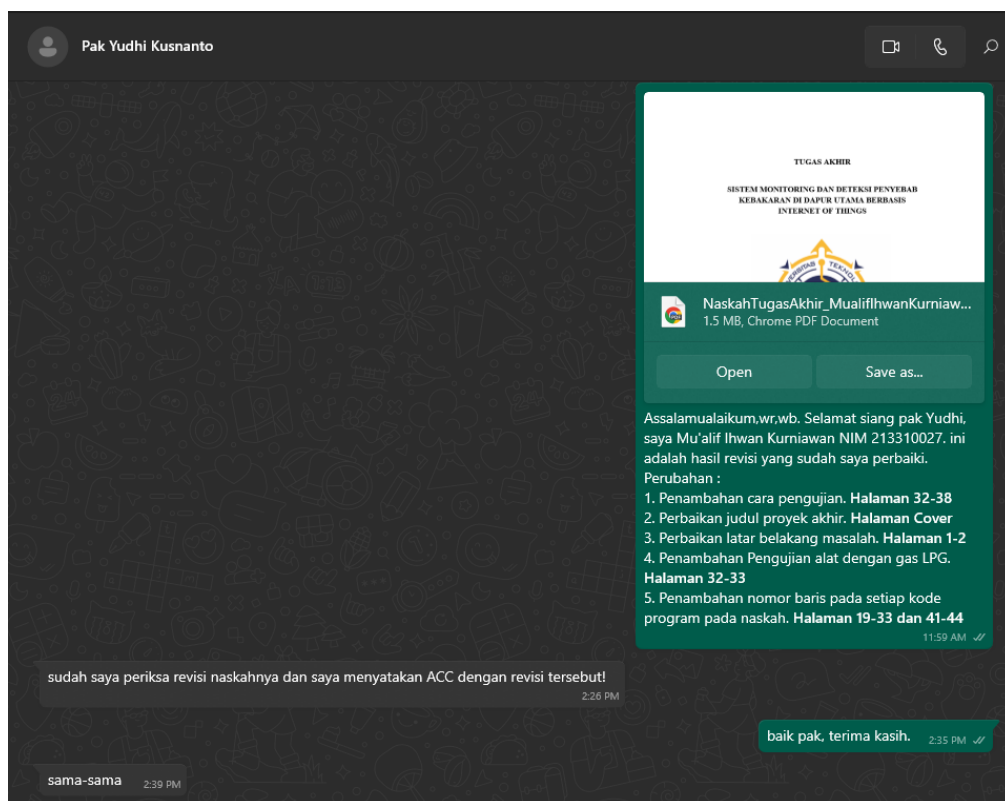
No	Hal yang harus diperbaiki	Pemberi Catatan
1.	Pada diagram Hardware->diubah menjadi diagram blok (bisa mengurangi cross). Tambahkan penjelasan terkait notifikasi Blynk.	P. Totok
2.	Jelaskan cara pengujian. Betulkan programnya agar alat tetap berfungsi walau tidak ada layanan internet.	P. Yudhi
3.	- memperbaiki judul proyek akhir agar sesuai dengan karya (deteksi api, deteksi asap, deteksi gas) - memperbaiki latar belakang masalah lebih realistis - menguji alat dengan gas LPG (harus ekstra hati-hati) - memberi nomor baris pada setiap kode program ESP32 dalam pembahasan di naskah	YK

## Lampiran B.3 Catatan Hasil Ujian Pendadaran

## Lampiran C. Bukti ACC Revisi Dosen Penguji



### Lampiran C.1 Bukti ACC Revisi Dosen Penguji 1



### Lampiran C.2 Bukti ACC Revisi Dosen Penguji 2

**SURAT KETERANGAN PERSETUJUAN PUBLIKASI**

Bahwa yang bertanda tangan di bawah ini:

Nama : Mu'alif Ihwan Kurniawan  
NIM : 213310027  
Program Studi : Teknologi Komputer  
E-mail : mualif.ihwan@students.utdi.ac.id  
Judul Tugas Akhir : Sistem Monitoring Dan Deteksi Penyebab Kebakaran Di  
Dapur Utama Berbasis Internet Of Things

Menyerahkan karya ilmiah kepada pihak perpustakaan UTDI dan menyetujui untuk diunggah ke Repository Perpustakaan UTDI sesuai dengan ketentuan yang berlaku untuk kepentingan riset dan Pendidikan.

Yogyakarta, 18 Februari 2025

Penulis,



Mu'alif Ihwan Kurniawan

NIM: 213310027