# DAFTAR PUSTAKA


[1] Ahmin Ahmadil, 2018. Monitoring Water Level Control Berbasis Arduino Uno Menggunakan Lcd Lm016l. Jurnal EEITC, 1, 2615 - 2169.

[2] Siregar, Muhammad Rizki, 2021. Rancang Bangun Sistem Monitoring Air dan Minyak dalam Tangki Menggunakan Mikrokontroler ATMEGA 328. Fakultas Matematika dan Ilmu Pengetahuan Alam, Fisika Ekstensi. Medan : Universitas Sumatera Utara.

[3] Herdiana Yudhi, Triatna Angga, 2020. "Prototype Monitoring Ketinggian Air berbasis Internet of Things Menggunakan Blyink dan Node Mcu Esp 8266 Pada Tangki". Jurnal informatika, Computing, 7(1), 1 – 11.

[4] Ardiliansyah Aldiaz Rasyid, Puspitasari Mariana Diah, Arifianto Teguh, 2021. Rancang Bangun Prototipe Pompa Otomatis Dengan Fitur Monitoring Berbasis IoT Menggunakan Sensor Flow Meter dan Ultrasonik. Jurnal Explore IT, 13(2), 59 – 67.

[5] Wagino, Arafat, 2018. Monitoring dan Pengisian Air Tandon Otomatis Berbasis Arduino. Technologia Jurnal Ilmiah, 9(3), 192.

[6] Yuliaminuddin Vani, Krismes dan Jusuf, 2020. Prototipe sistem kontrol dan monitoring pada tangki air berbasis internet of things. Jurnal Autocracy, 7(1), 27 – 34.

[7] Ulumuddin, Sudrajat M, Rachmildha T.D, Ismail N, dan Hamidi E.A.Z, 2017. Prototipe Sistem Moitoring Air Pada Tangki Berbasis Internet of things Menggunakan NodeMCU Esp8266 dan Sensor Ultrasonik. SENTER, 100 -105.

[8] Nur ramdan Dadan, Hadiyoso sugondo, dan Dyah irawati Indrian, 2021. Sistem Monitoring Ketersediaan Air pada Perangkat Cuci Tangan Portable berbasis IoT. ELKOMIKA, 9 (2), 455- 466.

[9] Gunawan Indra, Akbar Taufik, dan Ilham M.giyandhi, 2020. Prototipe Penerapan Internet Of Things (Iot) Pada Monitoring Level Air Tandon Menggunakan Nodemcu Esp8266 Dan Blynk. Infotek, 3 (1), 1- 7.

[10] Widiyaman Tresna. 2021. “Pengertian Modul Wifi ESP8266”, diakses pada tanggal 9 agustus 2022.
[11] Mahardika Derwin. 2020. “Perbedaan NodeMCU, Wemos, dan ESP8266 Wifi Module untuk Perangkat IoT Mikrokontroler”, diakses pada tanggal 9 agustus 2022.
[12] Razor Aldy. 2020. “Sensor Ultrasonik Arduino HC-SR04 : Cara Kerja dan Program”, diakses pada tanggal 9 agustus 2022.
[13] Ruang Teknisi. 2022. “Cara kerja Sensor Ultrasonik HC SR04”, diakses pada tanggal 9 agustus 2022.
[14] Tokopedia. 2022. “800L/H 5M Submersible Water Pump Pompa DC 12V”, diakses pada tanggal 9 agustus 2022.
[15] Webstudie. 2019. “Power Supply”, diakes pada tanggal 9 agustus 2022
[16] Artha putu. 2020. “Menggunakan Water Level Sensor Arduino”. Mr-leong, diakses pada tanggal 9 agustus 2022
[17] Kurniawan Puthut, Pramana Rozeff, S.T., M.T., Nusyrwan Deny, S.T., M.Sc. . 2017. Prototype Sistem Deteksi Kebocoran Air Dan Pengurasan Secara Otomatis Pada Kapal Berbasis Arduino UNO dan Labview. Teknik Elektronikan Umrah.
[18] Nyebarilmu. 2017. “Tutorial Arduino Mengakses Sensor Hujan”, diakses pada tanggal 10 agustus 2022.
[19] Awwal jumadin. 2020. “Apa Itu MIT App Inventor, Berikut Penjelasannya”, diakses pada tanggal 10 agustus 2022.
[20] Razor aldy. 2020. “Modul Relay Arduino: Pengertian, Gambar, Skema, dan Lainnya”, diakses pada tanggal 10 agustus 2022.
[21] Hamdani Riyan, Puspita Heni, dan R. Wildan Dedy, 2019. Pembuatan Sistem Pengaman Kendaraan Bermotor Berbasis Radio Frequency Identification (RFID). INDEPT, 8 (2), 2087-9245.
[22] Razor aldy. 2020. “Arduino Nano: Pengertian, Fungsi, Pinout, dan Harga”, diakses 10 agustus 2022.
[23] Elektrologi. 2022. “Lcd 20 x 4”, diakses pada tanggal 10 agustus 2022
[24] Ajie. 2016. “Bekerja Dengan I2C LCD dan Arduino”, diakses pada tanggal 12 agustus 2022.

# LAMPIRAN A

```
#include <SoftwareSerial.h>
#include <Wire.h>
#include <LiquidCrystal_I2C.h>
SoftwareSerial s(2, 3);//r&t
LiquidCrystal_I2C lcd(0x27, 20, 4);
long awal = 0;
long interval = 300;
int echoPin1 = 4;
int initPin1 = 5;
int distance1 = 0;
String datastr;
int bak, sam1, sam2, sam3, dataPump;
int sat = 20, kebek = 10;
int persen=0;

void setup() {
  lcd.begin();
  s.begin(57600);
  Serial.begin(9600);
  pinMode(A0, INPUT_PULLUP); //torn
  pinMode(A1, INPUT_PULLUP); //sambungan1
  pinMode(A2, INPUT_PULLUP); //sambungan2
  pinMode(11, INPUT_PULLUP); //sambungan4
  pinMode(13, OUTPUT); //pump
  pinMode(initPin1, OUTPUT);
  pinMode(echoPin1, INPUT);
}

void loop() {
  distance1 = getDistance(initPin1,
echoPin1);
  persen=map(distance1,41,0,0,100);
  bak  = digitalRead(A0);
  sam1 = digitalRead(A1);
  sam2 = digitalRead(A2);
  sam3 = digitalRead(11);
```

```
  if ((millis() - awal) > interval) {
    printserial();
    awal = millis();
  }
  serialread();
  pumpAuto(dataPump, distance1);
  show(bak, sam1, sam2, sam3);
}
void show (int x1, int x2, int x3, int x4) {
  lcd.setCursor(12, 0);
  lcd.print("distance=");
  lcd.setCursor(12, 1);
  lcd.print(String(persen)+"%        ");

  if (x1 == 1) {
    lcd.setCursor(0, 0);
    lcd.print("toren=");
    lcd.setCursor(6, 0);
    lcd.print("bocor");
  }
  else {
    lcd.setCursor(0, 0);
    lcd.print("toren=");
    lcd.setCursor(6, 0);
    lcd.print(" aman");
  }
  ////////////////////////////
  if (x2 == 0) {
    lcd.setCursor(0, 1);
    lcd.print("samb1=");
    lcd.setCursor(6, 1);
    lcd.print("bocor");
  }
  else {
    lcd.setCursor(0, 1);
    lcd.print("samb1=");
    lcd.setCursor(6, 1);
    lcd.print(" aman");
```

```
  }
  ////////////////////////////////
  if (x3 == 0) {
    lcd.setCursor(0, 2);
    lcd.print("samb2=");
    lcd.setCursor(6, 2);
    lcd.print("bocor");
  }
  else {
    lcd.setCursor(0, 2);
    lcd.print("samb2=");
    lcd.setCursor(6, 2);
    lcd.print(" aman");
  }
  ////////////////////////////////
  if (x4 == 0) {
    lcd.setCursor(0, 3);
    lcd.print("samb3=");
    lcd.setCursor(6, 3);
    lcd.print("bocor");
  }
  else {
    lcd.setCursor(0, 3);
    lcd.print("samb3=");
    lcd.setCursor(6, 3);
    lcd.print(" aman");
  }
}
void pumpAuto(int x, int jarak) {

  if (bak == 1 or sam1 == 0 or sam2 == 0 or
sam3 == 0)
  {
    digitalWrite(13, HIGH);//mati
  }

  else
  {
```

```
    if (x == 1) {
      digitalWrite(13, LOW);//on manual
    }
    else
    { //auto disrance

      if (persen <= 10)
      {
        digitalWrite(13, LOW);
      }
      else if (persen< 20 and persen > 10)
      {
        digitalWrite(13, LOW);
      }
      else if (persen>= 90)
      {
        digitalWrite(13, HIGH);
      }
    }
  }

}



void printserial() {
  Serial.print("{");
  Serial.print(persen);
  Serial.print("~");
  Serial.print(bak);
  Serial.print("!");
  Serial.print(sam1);
  Serial.print("@");
  Serial.print(sam2);
  Serial.print("$");
  Serial.print(sam3);
  Serial.println("}");
```

```
  Serial.println(dataPump);


  s.print("{");
  s.print(persen);
  s.print("~");
  s.print(bak);
  s.print("!");
  s.print(sam1);
  s.print("@");
  s.print(sam2);
  s.print("#");
  s.print(sam3);
  s.println("}");
}

int getDistance (int initPin, int echoPin) {

  digitalWrite(initPin, HIGH);
  delayMicroseconds(10);
  digitalWrite(initPin, LOW);
  unsigned long pulseTime = pulseIn(echoPin,
HIGH);
  int distance = pulseTime / 58;
  return distance;
}

void serialread() {
  if (s.available() > 0) {
    datastr = s.readStringUntil('\n');
  }
  dataPump = datastr.toInt();
}
```

# LAMPIRAN B

```
#include <SoftwareSerial.h>
#if defined(ESP32)
#include <WiFi.h>
#include <FirebaseESP32.h>
#elif defined(ESP8266)
#include <ESP8266WiFi.h>
#include <FirebaseESP8266.h>
#endif
#include <addons/TokenHelper.h>
#include <addons/RTDBHelper.h>
#define WIFI_SSID "p"
#define WIFI_PASSWORD "qwertyuiop"


#define API_KEY "AIzaSyABPgrMv-
yfHwFvMub9a6tQn7bMmbxyvXs"
#define DATABASE_URL "https://monitoring-
water-torent-default-rtdb.firebaseio.com"
//<databaseName>.firebaseio.com or
<databaseName>.<region>.firebasedatabase.app
#define USER_EMAIL
"monitoringwatertorrent@gmail.com"
#define USER_PASSWORD "watertorent123"

FirebaseData fbdo;
FirebaseAuth auth;
FirebaseConfig config;



SoftwareSerial s(12, 14);//r&t

String data1;
unsigned long awal = 0;
String dat = "";
String dis, tampung, bocor1, bocor2, bocor3;
```

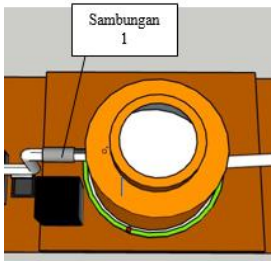
```
unsigned long count = 0;
int a , b , c , d, e , f;
int jarak, bocorT, bocorS1, bocorS2, bocorS3;
void setup()
{

  Serial.begin(115200);
  s.begin(57600);
  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();
  Serial.printf("Firebase Client v%s\n\n",
FIREBASE_CLIENT_VERSION);
  /* Assign the api key (required) */
  config.api_key = API_KEY;
  auth.user.email = USER_EMAIL;
  auth.user.password = USER_PASSWORD;
  config.database_url = DATABASE_URL;
  config.token_status_callback =
tokenStatusCallback; //see
addons/TokenHelper.h
  Firebase.begin(&config, &auth);
  Firebase.reconnectWiFi(true);
//  Firebase.setDoubleDigits(5);

}

void loop()
{
  serialread();
```

```
  if (count == 0) {
    Firebase.setString(fbdo,
"/jarak",String(jarak));
    count = 1;
  }
  else if (count == 1) {
    Firebase.setString(fbdo,"/toren",
String(bocorT));
    count = 2;
  }
  else if (count == 2) {
    Firebase.setString(fbdo,"/sambungan1",
String(bocorS1));
    count = 3;
  }
  else if (count == 3) {
    Firebase.setString(fbdo,"/sambungan2",
String(bocorS2));
    count = 4;
  }
    else if (count == 4) {
    Firebase.setString(fbdo,"/sambungan3",
String(bocorS3));
    count = 5;
  }
      else if (count == 5) {
    data1 = Firebase.getString(fbdo,
"/control") ? fbdo.to<const char *>() :
fbdo.errorReason().c_str();
    count = 0;
  }

  if ((millis() - awal) > 2000) {

    Serial.print("Received String: ");
    Serial.println(data1);
    s.print(data1);
    s.println();
```

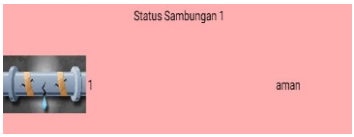
```
    awal = millis();
  }
}


//void get_firebase(){
//  int
getdata=firebase.getString("control");
//  if (getdata==0){
//    digitalWrite(LED_BUILTIN,fi==HIGH);
//  }
//  else if(getdata==1){
//    digitalWrite(LED_BUILTIN,LOW);
//  }
//}



void serialread() {
  if (s.available() > 0) {
    dat = s.readStringUntil('\n');
  }
  a = dat.indexOf('{');
  b = dat.indexOf('~');
  c = dat.indexOf('!');
  d = dat.indexOf('@');
  f = dat.indexOf('#');
  e = dat.indexOf('}');

  dis = dat.substring(a + 1, b);
  tampung = dat.substring(b + 1, c);
  bocor1 = dat.substring(c + 1, d);
  bocor2 = dat.substring(d + 1, f);
  bocor3 = dat.substring(f + 1, e);

  jarak = dis.toInt();
  bocorT = tampung.toInt();
  bocorS1 = bocor1.toInt();
```

```
  bocorS2 = bocor2.toInt();
  bocorS3 = bocor3.toInt();

  Serial.print (dis);
  Serial.print(" ");
  Serial.print(tampung);
  Serial.print(" ");
  Serial.print(bocor1);
  Serial.print(" ");
  Serial.print(bocor2);
  Serial.print(" ");
  Serial.print(bocor3);
  Serial.println(" ");


}
```

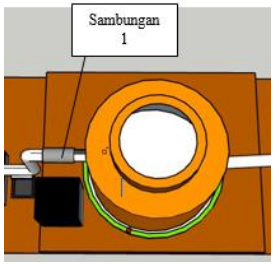
# LAMPIRAN C

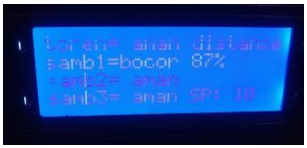


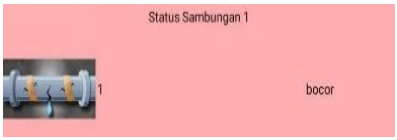




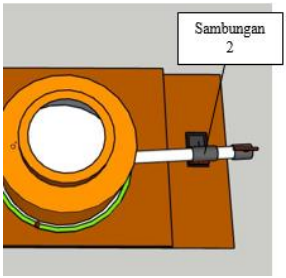

**Gambar percobaan 1  pada pengujian kebocoran**



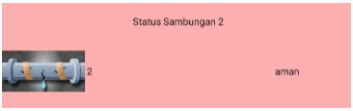



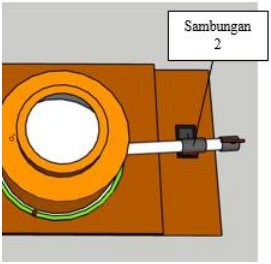

**Gambar percobaan 2  pada pengujian kebocoran**



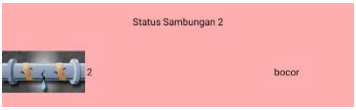




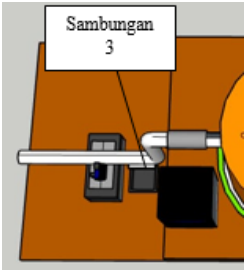

**Gambar percobaan 3  pada pengujian kebocoran**





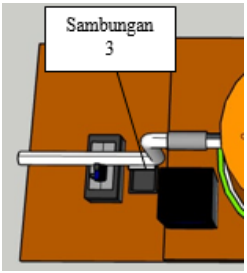



**Gambar percobaan 4  pada pengujian kebocoran**



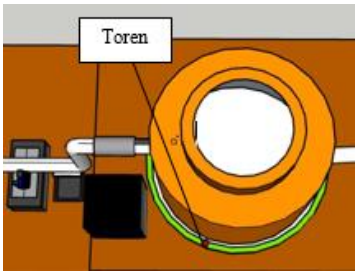



**Gambar percobaan 5  pada pengujian kebocoran**

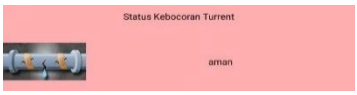




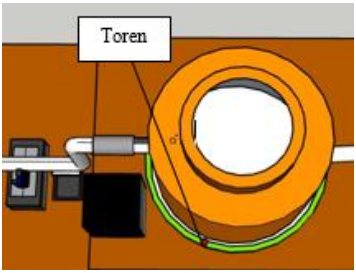

**Gambar percobaan 6  pada pengujian kebocoran**



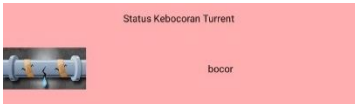





**Gambar percobaan 7  pada pengujian kebocoran**








**Gambar percobaan 8  pada pengujian kebocoran**

# BIODATA PENULIS

| | |
|---|---|
| Nama | : Nerfansaghi Akama |
| Tempat /Tanggal lahir | : Temanggung, 5 April 2001 |
| Alamat | : Perum green hill Block C no 6 Rt 01 / Rw XII, Kecamatan Jeruklegi, Kabupaten Cilacap. |
| Telepon/Hp | : 089607346100 |
| Hobi | : Futsal |
| Email | : Nerfansaghiakam54@gmail.com |
| Riwayat Pendidikan | : |

- SDN 04 Tritih Wetan Cilacap : 2007 - 2013
- SMPN 7 Cilacap : 2013 - 2016
- SMKN 2 Cilacap : 2016 - 2019
- Politeknik Negeri Cilacap : 2019 - 2022