

LAMPIRAN

```
//wifi
#include <ESP8266WiFi.h>
#include <ESP8266HTTPClient.h>
#include <WiFiClient.h>

//setting jaringan
const char* ssid = "SK_DJ";
const char* pass = "123456789";
const char* host = "irfanfadilla.tech";

//tds
#define TdsSensorPin A0
#define VREF 3.3 // analog reference voltage(Volt) of the ADC
#define SCOUNT 30 // sum of sample point
int analogBuffer[SCOUNT]; // store the analog value in the array, read from
ADC
int analogBufferTemp[SCOUNT];
int analogBufferIndex = 0, copyIndex = 0;
float averageVoltage = 0, tdsValue = 0, temperature = 25;

//ultrasonic
#define triggerPin 15
#define echoPin 13

//relay
#define relayPompa 5
#define relayValveAir 4
#define relayDinamo 14
#define relayValveKuras 12

void setup()
{
  Serial.begin(115200);

  //setting koneksi wifi
  WiFi.hostname("NodeMCU");
```

```
WiFi.begin(ssid, pass);  
  
//cek koneksi wifi  
while (WiFi.status() != WL_CONNECTED)  
{  
  Serial.print(".");  
  delay(500);  
}  
Serial.print("Connected: ");  
Serial.println(WiFi.localIP());  
  
//tds  
pinMode(TdsSensorPin, INPUT);  
  
//ultrasonic  
pinMode(triggerPin, OUTPUT);  
pinMode(echoPin, INPUT);  
  
//relay  
pinMode(relayPompa, OUTPUT);  
pinMode(relayValveAir, OUTPUT);  
pinMode(relayValveKuras, OUTPUT);  
digitalWrite(relayValveKuras, LOW);  
pinMode(relayDinamo, OUTPUT);  
}  
  
void loop()  
{  
  //tds  
  static unsigned long analogSampleTimepoint = millis();  
  if (millis() - analogSampleTimepoint > 400) //every 400 milliseconds,read the  
  analog value from the ADC  
  {  
    analogSampleTimepoint = millis();
```

```

    analogBuffer[analogBufferIndex] = analogRead(TdsSensorPin); //read the
    analog value and store into the buffer

    analogBufferIndex++;

    if (analogBufferIndex == SCOUNT)
        analogBufferIndex = 0;
}

static unsigned long printTimepoint = millis();

if (millis() - printTimepoint > 800U)
{
    printTimepoint = millis();

    for (copyIndex = 0; copyIndex < SCOUNT; copyIndex++)
        analogBufferTemp[copyIndex] = analogBuffer[copyIndex];

    averageVoltage = getMedianNum(analogBufferTemp, SCOUNT) *
(float)VREF / 1024.0; // read the analog value more stable by the median filtering
algorithm, and convert to voltage value

    float compensationCoefficient = 1.0 + 0.02 * (temperature - 25.0);
//temperature compensation formula: fFinalResult(25^C) =
fFinalResult(current)/(1.0+0.02*(fTP-25.0));

    float compensationVolatge = averageVoltage / compensationCoefficient;
//temperature compensation

    tdsValue = (133.42 * compensationVolatge * compensationVolatge *
compensationVolatge - 255.86 * compensationVolatge * compensationVolatge +
857.39 * compensationVolatge) * 0.5; //convert voltage value to tds value

    //Serial.print("voltage:");

    //Serial.print(averageVoltage,2);

    //Serial.print("V  ");

    Serial.print("TDS Value:");

    Serial.print(tdsValue, 0);

    Serial.println("ppm");
}

//ultrasonic

long duration, jarak;

```

```

digitalWrite(triggerPin, LOW);
delayMicroseconds(2);
digitalWrite(triggerPin, HIGH);
delayMicroseconds(10);
digitalWrite(triggerPin, LOW);
duration = pulseIn(echoPin, HIGH);
jarak = (duration / 2) / 29.1;
Serial.println("jarak :");
Serial.print(jarak);
Serial.println(" cm");

//RELAY VALVE AIR
if (jarak >= 5)
{
  digitalWrite(relayValveAir, HIGH);
} else {
  digitalWrite(relayValveAir, LOW);
}

//KIRIM DATA KE SERVER
WiFiClient client ;
const int httpPort = 80;
if ( !client.connect(host, httpPort))
{
  Serial.println("Connection Failed");
  return;
}

//kirim data sensor ke web
String Link;

```

```
HTTPClient http;

Link = "http://" + String(host) + "/kirimdata.php?jarak=" + String(jarak) +
"&tdsValue=" + String(tdsValue);

//eskseseksi alamat link
http.begin(client, Link);

http.GET();

//baca respon setelah berhasil kirim sensor
String respon = http.getString();

Serial.println(respon);

http.end();

//untuk relay
String LinkRelay;
HTTPClient httpRelay;
LinkRelay = "http://" + String(host) + "/bacarelay.php";
httpRelay.begin(client, LinkRelay);
httpRelay.GET();

//baca status response
String responseRelay = httpRelay.getString();

Serial.println(responseRelay);

httpRelay.end();

//ubah status relay di nodemcu
digitalWrite(relayValveKuras, responseRelay.toInt());

//untuk tds
String LinkTds;
HTTPClient httpTds;
LinkTds = "http://" + String(host) + "/bacatds.php";
httpTds.begin(client, LinkTds);
httpTds.GET();

//baca status response
String responseTds = httpTds.getString();
```

```

Serial.println(responseTds);
httpTds.end();

if ( (jarak <= 5) && (tdsValue <= responseTds.toInt()) )
{
    digitalWrite(relayPompa, HIGH);
    digitalWrite(relayDinamo, HIGH);
} else {
    digitalWrite(relayPompa, LOW);
    digitalWrite(relayDinamo, LOW);
}

delay(500);
}

//array untuk menyimpan nilai tds
int getMedianNum(int bArray[], int iFilterLen)
{
    int bTab[iFilterLen];
    for (byte i = 0; i < iFilterLen; i++)
        bTab[i] = bArray[i];
    int i, j, bTemp;
    for (j = 0; j < iFilterLen - 1; j++)
    {
        for (i = 0; i < iFilterLen - j - 1; i++)
        {
            if (bTab[i] > bTab[i + 1])
            {
                bTemp = bTab[i];

```

```
        bTab[i] = bTab[i + 1];
        bTab[i + 1] = bTemp;
    }
}
}
if ((iFilterLen & 1) > 0)
    bTemp = bTab[(iFilterLen - 1) / 2];
else
    bTemp = (bTab[iFilterLen / 2] + bTab[iFilterLen / 2 - 1]) / 2;
return bTemp;
}

<!-- baca status terakhir relay dan slider -->
<?php
//include koneksi
$koneksi = mysqli_connect("localhost", "root", "", "dbmultisensor");

$sql = mysqli_query($koneksi, "SELECT * FROM tb_kontrol");
$data = mysqli_fetch_array($sql);
//ambil status relay
$relay = $data['relay'];
//ambil posisi slider
$slider = $data['slider'];
?>

<!-- baca status terakhir air -->
<?php
$sql = mysqli_query($koneksi, "select * from tb_sensor order by id desc");
$data = mysqli_fetch_array($sql);
```



```

//ambil status air
$air = $data['air'];
?>

<!doctype html>
<html lang="en">

<head>
  <!-- Required meta tags -->
  <meta charset="utf-8">
  <meta name="viewport" content="width=device-width, initial-scale=1, shrink-
to-fit=no">

  <!-- Bootstrap CSS -->
  <link
href="https://cdn.jsdelivr.net/npm/bootstrap@5.0.2/dist/css/bootstrap.min.css"
rel="stylesheet"
integrity="sha384-
EVSTQN3/azprG1Anm3QDgpJLIm9Nao0Yz1ztcQTWfSpd3yD65VohhpuuCOM
LASjC" crossorigin="anonymous">

  <title>Monitoring & Kontrol Nutrisi Hidroponik</title>

  <script type="text/javascript" src="jquery/jquery.min.js"></script>
  <!-- Script Realtime -->
  <script type="text/javascript">
$(document).ready(function() {

  setInterval(function() {
    $("#cekair").load("cekair.php");
    $("#cektds").load("cektds.php");
  }

```

```

    }, 1000);
});
</script>

<!-- Script Relay -->
<script type="text/javascript">
function ubahstatus(value) {
    if (value == true) value = "ON";
    else value = "OFF";
    document.getElementById('status').innerHTML = value;

    // Ajax untuk merubah status Relay
    var xmlhttp = new XMLHttpRequest();

    xmlhttp.onreadystatechange = function() {
        if (xmlhttp.readyState == 4 && xmlhttp.status == 200) {
            //ambil respon dari web setelah berhasil merubah nilai
            document.getElementById('status').innerHTML =
xmlhttp.responseText;
        }
    }

    //execute file PHP untuk merubah nilai di database
    xmlhttp.open("GET", "relay.php?stat=" + value, true);
    //kirim data
    xmlhttp.send();
}

function ubahposisi(value) {
    document.getElementById('posisi').innerHTML = value;
}

```

```

// Ajax untuk merubah status slider
var xmlhttp = new XMLHttpRequest();

xmlhttp.onreadystatechange = function() {
    if (xmlhttp.readyState == 4 && xmlhttp.status == 200) {
        //ambil respon dari web setelah berhasil merubah nilai
        document.getElementById('posisi').innerHTML =
xmlhttp.responseText;
    }
}

//execute file PHP untuk merubah nilai di database
xmlhttp.open("GET", "slider.php?pos=" + value, true);
//kirim data
xmlhttp.send();
}
</script>

</head>

<body>

<div class="container" style="text-align: center; margin-top: 20px">
    <h2>Monitoring dan Kontrol <br> Nutrisi Hidroponik</h2>
    <div style="display: flex; margin-top: 20px">
        <!-- Menampilkan Nilai Air -->
        <div class="card text-center" style="width: 50%">
            <div class="card-header"
                style="font-size: 20px; font-weight: bold; background-color: blue;
color: white">
                Volume Air

```

```

</div>
<div class="card-body">
  <h2> <span id="cekair"> 0 </span> </h2>
  <h2> <?php ?>
  </h2>
</div>
</div>
<!-- Akhir Menampilkan Nilai Air -->

<!-- Menampilkan Nilai TDS -->
<div class="card text-center" style="width: 50%">
  <div class="card-header"
    style="font-size: 20px; font-weight: bold; background-color: green;
color: white">
    Nilai TDS
  </div>
  <div class="card-body">
    <h2> <span id="cektds"> 0 </span> PPM </h2>
  </div>
</div>
<!-- Akhir Menampilkan Nilai TDS -->
</div>
</div>

<!-- Slider -->
<div class="container" style="text-align: center; margin-top: 20px">
  <div class="card text-center">
    <div class="card-header"
      style="font-size: 20px; font-weight: bold; text-align:center; background-
color: lime; color: white">

```

Set Nilai TDS

```

</div>

<div class="card-body">

  <div style="text-align: center; font-size: 20px">

    <label for="customRange2" class="form-label"> <span id="posisi">
<?php echo $slider; ?> </span>

      PPM </label>

    <input type="range" class="form-range" id="customRange2"
min="0" max="2000" step="50"

      value="<?php echo $slider; ?>"
onchange="ubahposisi(this.value)">

    </div>

  </div>

</div>

</div>

<!-- Akhir Slider -->

<!-- Switch -->

<div class="container" style="text-align: center; margin-top: 20px">

  <div class="card text-center" style="width: 170px">

    <div class="card-header"

      style="font-size: 20px; font-weight: bold; text-align:center; background-
color: red; color: white">

      Kuras

    </div>

    <div class="card-body">

      <div class="form-check form-switch" style="font-size: 30px">

        <input class="form-check-input" type="checkbox"
id="flexSwitchCheckDefault"

          onchange="ubahstatus(this.checked)" <?php if($relay==1) echo
"checked"; ?>>

```

```

        <label class="form-check-label" for="flexSwitchCheckDefault">
<span id="status">
            <?php if($relay==1) echo "ON"; else echo "OFF"; ?> </span>
</label>
        </div>
    </div>
</div>
<div class="container">
    
</div>
</div>
<!-- Akhir Switch -->
<script
src="https://cdn.jsdelivr.net/npm/bootstrap@5.0.2/dist/js/bootstrap.bundle.min.js"
    integrity="sha384-
MrcW6ZMFYlzcLA8Nl+NtUVF0sA7MsXsP1UyJoMp4YLEuNSfAP+JcXn/tWt
IaxVXM" crossorigin="anonymous">
    </script>
</body>
</html>

<?php
    $koneksi = mysqli_connect("localhost", "root", "", "dbmultisensor");

    $sql = mysqli_query($koneksi, "SELECT * FROM tb_kontrol");
    $data = mysqli_fetch_array($sql);
    $relay = $data['relay'];

    //response balik ke nodemcu
    echo $relay;
?>

```

```

<?php
    $koneksi = mysqli_connect("localhost", "root", "", "dbmultisensor");

    $sql = mysqli_query($koneksi, "SELECT * FROM tb_kontrol");
    $data = mysqli_fetch_array($sql);
    $slider = $data['slider'];

    //response balik ke nodemcu
    echo $slider;

?>

```

```

<?php
    //Koneksi ke Database
    $koneksi = mysqli_connect("localhost", "root", "", "dbmultisensor");

    //Baca data dari tabel tb_sensor
    $sql = mysqli_query($koneksi, "select * from tb_sensor order by id desc");
    //data terakhir berada di atas

    //baca data paling atas
    $data = mysqli_fetch_array($sql);
    $air = $data['air'];

    //uji, apabila nilai belum ada, maka anggap 0
    //if( $air == "" ) $air = 0;

    //cetak nilai
    //echo $air ;

    if($air>=11) echo $air="Air Habis";if($air==10) echo $air="Air
Kurang";if($air==9) echo $air="Air Kurang";if($air==8) echo $air="Air
Kurang";if($air==7) echo $air="Air Kurang";if($air==6) echo $air="Air
Penuh";if($air==5) echo $air="Air Penuh";if($air==4) echo $air="Air

```

```
Penuh";if($air==3) echo $air="Air Penuh";if($air==2) echo $air="Air  
Penuh";if($air==1) echo $air="Air Penuh"
```

```
?>
```

```
<?php
```

```
//Koneksi ke Database
```

```
$koneksi = mysqli_connect("localhost", "root", "", "dbmultisensor");
```

```
//Baca data dari tabel tb_sensor
```

```
$sql = mysqli_query($koneksi, "select * from tb_sensor order by id desc");
```

```
//data terakhir berada di atas
```

```
//baca data paling atas
```

```
$data = mysqli_fetch_array($sql);
```

```
$tds = $data['tds'];
```

```
//uji, apabila nilai belum ada, maka anggap 0
```

```
if( $tds == "" ) $tds = 0;
```

```
//cetak nilai
```

```
echo $tds ;
```

```
?>
```

```
<?php
```

```
//Koneksi ke Database
```

```
$koneksi = mysqli_connect("localhost", "root", "", "dbmultisensor");
```

```
$jarak = $_GET['jarak'];
```

```
$tdsValue = $_GET['tdsValue'];
```



```

//simpan ke tabel tb_sensor

//auto increment = 1 / mengembalikan id kembali ke 1 lagi apabila dikosongkan
mysql_query($koneksi, "ALTER TABLE tb_sensor
AUTO_INCREMENT=1");

//simpan data sensor ke table tb_sensor

$simpan = mysql_query($koneksi, "insert into tb_sensor(air,
tds)values('$jarak', '$tdsValue')");

//uji respon simpan
if($simpan)
echo "Berhasil Dikirim";
else
echo "Gagal Terkirim";
?>

<?php
// include koneksi
$koneksi = mysql_connect("localhost", "root", "", "dbmultisensor");

//tangkap parameter stat yang dikirim ajax
$stat = $_GET['stat'];
if($stat == "ON")
{
//ubah field relay menjadi 1
mysql_query($koneksi, "UPDATE tb_kontrol SET relay=1");
//berikan respon
echo "ON";
}
else
{

```

```
//ubah field relay menjadi 0
mysqli_query($koneksi, "UPDATE tb_kontrol SET relay=0");
//berikan respon
echo "OFF";
}
?>

<?php
// include koneksi
$koneksi = mysqli_connect("localhost", "root", "", "dbmultisensor");

//tangkap variabel pos dari ajax
$pos = $_GET['pos'];
//update nilai di field slider yang ada di database
mysqli_query($koneksi, "UPDATE tb_kontrol SET slider='$pos'");
//berikan response
echo $pos;
?>
```