

## LAMPIRAN

### Lampiran 1. Program ESP 8266.

```
#include <ESP8266WiFi.h>
#include <SPI.h>
#include <Wire.h>
#include <EEPROM.h>

const char *ssid = "Workshop";
const char *pass = "dhcpserver";
const char* host = "192.168.1.100";

#define LED_BUILTIN 16
#define SENSOR D3
#define EEPROM_SIZE 4

long currentMillis = 0;
long previousMillis = 0;
int interval = 1000;
boolean ledState = LOW;
float calibrationFactor = 6.88;
volatile byte pulseCount;
byte pulseSec = 0;
float flowRate;
unsigned long flowMilliLitres;
unsigned int totalMilliLitres;
float flowLitres;
float totalLitres;
float totalizer;
float oldTotalizer;
float newTotalizer;

void IRAM_ATTR pulseCounter()
{
    pulseCount++;
}

WiFiClient client;

void setup()
{
    Serial.begin(9600);
    EEPROM.begin(EEPROM_SIZE);
    delay(10);

    pinMode(LED_BUILTIN, OUTPUT);
    pinMode(SENSOR, INPUT_PULLUP);

    pulseCount = 0;
    flowRate = 0.0;
    flowMilliLitres = 0;
```

```

totalMilliLitres = 0;
previousMillis = 0;
float newTotalizer;

attachInterrupt(digitalPinToInterrupt(SENSOR), pulseCounter, FALLING);
WiFi.begin(ssid, pass);

while (WiFi.status() != WL_CONNECTED) {
    delay(100);
    pinMode(LED_BUILTIN, OUTPUT);
    Serial.print(".");
}

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

void loop()
{
    int EAddress = 0;
    newTotalizer = EEPROM.read(EAddress);
    Serial.print("First: ");
    Serial.print(newTotalizer); // Print the integer part of the variable
    Serial.print("L/min");
    Serial.print("\t");
    currentMillis = millis();
    if (currentMillis - previousMillis > interval)
    {

        pulse1Sec = pulseCount;
        pulseCount = 0;
        totalMilliLitres = 0;
        totalLitres = 0;

        flowRate = ((1000.0 / (millis() - previousMillis)) * pulse1Sec) /
calibrationFactor;
        previousMillis = millis();

        flowMilliLitres = (flowRate / 60) * 1000;
        flowLitres = (flowRate / 60);

        totalMilliLitres += flowMilliLitres;
        totalLitres += flowLitres;
        totalizer = 5;
        newTotalizer = EEPROM.read(0) + totalLitres;
        EEPROM.write(0,newTotalizer);
        EEPROM.commit();
        Serial.print("Flow rate: ");
        Serial.print(float(flowRate)); // Print the integer part of the variable
        Serial.print("L/min");
        Serial.print("\t"); // Print tab space
    }
}

```

```

// Print the cumulative total of litres flowed since starting
Serial.print("Output Liquid Quantity: ");
Serial.print(totalMilliLitres);
Serial.print("mL / ");
Serial.print(totalLitres);
Serial.println("L");

Serial.print("\t"); // Print tab space
Serial.print("Totaliser: ");
Serial.print(newTotalizer);
Serial.println("L");

Serial.print("connecting to ");
Serial.println(host);

// Use WiFiClient class to create TCP connections
WiFiClient client;
const int httpPort = 80;
if (!client.connect(host, httpPort)) {
    Serial.println("connection failed");
    return;
}

// This will send the request to the server
client.print(String("GET http://192.168.1.100/monitoring/connect.php?")
+
    ("rate=") + float(flowRate) +
    ("&id=") + "sensor2" +
    ("&totaliser=") + newTotalizer +
    ("&pulsa=") + pulse1Sec +
    " HTTP/1.1\r\n" +
    "Host: " + host + "\r\n" +
    "Connection: close\r\n\r\n");
unsigned long timeout = millis();
while(client.available()) {

    String line = client.readStringUntil('\r');
    Serial.print(line);
}
}
Serial.println();
Serial.println("closing connection");
}

```

## Lampiran 2. Program index.php.

```
<?php
include 'connectdb.php';
?>

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

<head>

    <meta charset="utf-8">
    <meta http-equiv="X-UA-Compatible" content="IE=edge">
    <meta name="viewport" content="width=device-width, initial-scale=1,
shrink-to-fit=no">
    <meta name="description" content="">
    <meta name="author" content="">

    <title>Dashboard</title>

    <!-- Custom fonts for this template-->
    <link href="vendor/fontawesome-free/css/all.min.css" rel="stylesheet"
type="text/css">
    <link

href="https://fonts.googleapis.com/css?family=Nunito:200,200i,300,300i,400
,400i,600,600i,700,700i,800,800i,900,900i"
    rel="stylesheet">

    <!-- Custom styles for this template-->
    <link href="css/sb-admin-2.min.css" rel="stylesheet">
    <style>
        #chartdiv {
            width: 100%;
            height: 300px;
        }
    </style>

<!-- <div id="chartdiv"></div> -->

</head>

<body id="page-top">

    <!-- Page Wrapper -->
    <div id="wrapper">

        <!-- Sidebar -->
        <ul class="navbar-nav bg-gradient-primary sidebar sidebar-dark
accordion" id="accordionSidebar">

            <!-- Sidebar - Brand -->
            <a class="sidebar-brand d-flex align-items-center justify-
content-center" href="index.html">
```

```

        <div class="sidebar-brand-icon">
            
        </div>
        <!-- <div class="sidebar-brand-text mx-3">Flow
Monitoring</div> -->
    </a>

    <!-- Divider -->
    <hr class="sidebar-divider my-0">

    <!-- Nav Item - Dashboard -->
    <li class="nav-item active">
        <a class="nav-link" href="index.html">
            <i class="fas fa-fw fa-tachometer-alt"></i>
            <span>Dashboard</span></a>
    </li>

    <!-- Divider -->
    <hr class="sidebar-divider">

    <!-- Heading -->

    <!-- Heading -->
    <div class="sidebar-heading">
        Addons
    </div>

    <!-- Nav Item - Pages Collapse Menu -->

    <!-- Nav Item - Charts -->
    <li class="nav-item">
        <a class="nav-link" href="charts.html">
            <i class="fas fa-fw fa-chart-area"></i>
            <span>Record</span></a>
    </li>

    <!-- Nav Item - Tables -->

    <!-- Divider -->
    <hr class="sidebar-divider d-none d-md-block">

</ul>
<!-- End of Sidebar -->

<!-- Content Wrapper -->
<div id="content-wrapper" class="d-flex flex-column">

    <!-- Main Content -->
    <div id="content">

```

```

        <!-- Topbar -->
        <nav class="navbar navbar-expand navbar-light bg-white
topbar mb-4 static-top shadow">

            <!-- Sidebar Toggle (Topbar) -->
            <button id="sidebarToggleTop" class="btn btn-link d-md-
none rounded-circle mr-3">
                <i class="fa fa-bars"></i>
            </button>

            <!-- Topbar Search -->
            <a class="sidebar-brand d-flex align-items-center
justify-content-center" href="index.html">
                <H3 class="text-xl-left">Flow Rate Monitoring</H3>
            </a>

            <!-- Topbar Navbar -->
            <ul class="navbar-nav ml-auto">

                <!-- Nav Item - Search Dropdown (Visible Only XS) -
->

                <div class="topbar-divider d-none d-sm-
block"></div>

                <!-- Nav Item - User Information -->
                <li class="nav-item dropdown no-arrow">
                    <a class="nav-link dropdown-toggle" href="#"
id="userDropdown" role="button"
                    data-toggle="dropdown" aria-haspopup="true"
aria-expanded="false">
                        <span class="mr-2 d-none d-lg-inline text-
gray-600 small">Administrator</span>
                        
                    </a>
                    <!-- Dropdown - User Information -->
                    <div class="dropdown-menu dropdown-menu-right
shadow animated--grow-in"
aria-labelledby="userDropdown">
                        <a class="dropdown-item" href="#">
                            <i class="fas fa-user fa-sm fa-fw mr-2
text-gray-400"></i>
                            Profile
                        </a>
                        <a class="dropdown-item" href="#">
                            <i class="fas fa-cogs fa-sm fa-fw mr-2
text-gray-400"></i>
                            Settings
                        </a>
                        <a class="dropdown-item" href="#">

```

```

                <i class="fas fa-list fa-sm fa-fw mr-2
text-gray-400"></i>
                Activity Log
            </a>
            <div class="dropdown-divider"></div>
            <a class="dropdown-item" href="#" data-
toggle="modal" data-target="#logoutModal">
                <i class="fas fa-sign-out-alt fa-sm fa-
fw mr-2 text-gray-400"></i>
                Logout
            </a>
        </div>
    </li>
</ul>

</nav>
<!-- End of Topbar -->

<!-- Begin Page Content -->
<div class="container-fluid">

    <!-- Page Heading -->
    <div class="row d-flex justify-content-between">

        <!-- Earnings (Monthly) Card Example -->
        <div class="col-xl-3 col-md-6 mb-4">
            <div class="card border-left-success shadow h-
100 py-2">
                <div class="card-body">
                    <div class="row no-gutters align-items-
center">
                        <div class="col mr-2">
                            <div class="text-xs font-
weight-bold text-success text-uppercase mb-1">
                                Sensor 1</div>
                            <div id='sensor1' class="h5 mb-
0 font-weight-bold text-gray-800">0 L/min </div>
                        </div>
                        <div class="col-auto">
                            <i class="fas fa-calendar fa-2x
text-gray-300"></i>
                        </div>
                    </div>
                </div>
            </div>
        </div>

        <!-- Earnings (Monthly) Card Example -->
        <div class="col-xl-3 col-md-6 mb-4">
            <div class="card border-left-primary shadow h-
100 py-2">
                <div class="card-body">

```

```

        <div class="row no-gutters align-items-
center">
            <div class="col mr-2">
                <div class="text-xs font-
weight-bold text-primary text-uppercase mb-1">
                    Sensor 2</div>
                <div id='sensor2' class="h5 mb-
0 font-weight-bold text-gray-800">0 L/min </div>
                </div>
            <div class="col-auto">
                <i class="fas fa-dollar-sign
fa-2x text-gray-300"></i>
            </div>
        </div>
    </div>
</div>
</div>
<!-- Pending Requests Card Example -->
<div class="col-xl-3 col-md-6 mb-4">
    <div class="card border-left-warning shadow h-
100 py-2">
        <div class="card-body">
            <div class="row no-gutters align-items-
center">
                <div class="col mr-2">
                    <div class="text-xs font-
weight-bold text-warning text-uppercase mb-1">
                        Sensor 3</div>
                    <div id='sensor3' class="h5 mb-
0 font-weight-bold text-gray-800">0 L/min </div>
                    </div>
                <div class="col-auto">
                    <i class="fas fa-comments fa-2x
text-gray-300"></i>
                </div>
            </div>
        </div>
    </div>
</div>
</div>
<div class="col-xl-12 col-lg-12">
    <!-- Area Chart -->
    <div class="card shadow mb-8 "style="min-
height: 400px;" >
        <div class="card-header py-3" >
            <h6 class="m-0 font-weight-bold text-
primary">Area Chart</h6>
        </div>
        <div class="card-body">

```



```

        <div class="chart-area">
            <div id="chartdiv"></div>
        </div>

        </div>
    </div>

    </div>

    </div>
<!-- End of Main Content -->

<!-- Footer -->
<footer class="sticky-footer bg-white">
    <div class="container my-auto">
        <div class="copyright text-center my-auto">
            <span>Copyright &copy; Your Website 2020</span>
        </div>
    </div>
</footer>
<!-- End of Footer -->

</div>
<!-- End of Content Wrapper -->

</div>
<!-- End of Page Wrapper -->

<!-- Scroll to Top Button-->
<a class="scroll-to-top rounded" href="#page-top">
    <i class="fas fa-angle-up"></i>
</a>

<!-- Logout Modal-->
<div class="modal fade" id="logoutModal" tabindex="-1" role="dialog"
aria-labelledby="exampleModalLabel"
aria-hidden="true">
    <div class="modal-dialog" role="document">
        <div class="modal-content">
            <div class="modal-header">
                <h5 class="modal-title" id="exampleModalLabel">Ready to
Leave?</h5>
                <button class="close" type="button" data-
dismiss="modal" aria-label="Close">
                    <span aria-hidden="true">×</span>
                </button>
            </div>
            <div class="modal-body">Select "Logout" below if you are
ready to end your current session.</div>
            <div class="modal-footer">

```

```

        <button class="btn btn-secondary" type="button" data-
dismiss="modal">Cancel</button>
        <a class="btn btn-primary" href="login.html">Logout</a>
    </div>
</div>
</div>
</div>

<!-- Bootstrap core JavaScript-->

<script src="vendor/jquery/jquery.min.js"></script>
<script src="vendor/bootstrap/js/bootstrap.bundle.min.js"></script>

<!-- Core plugin JavaScript-->
<script src="vendor/jquery-easing/jquery.easing.min.js"></script>

<!-- Custom scripts for all pages-->
<script src="js/sb-admin-2.min.js"></script>

<script src="amchart/index.js"></script>
<script src="amchart/xy.js"></script>
<script src="amchart/Animated.js"></script>
<script src="chart.js"></script>

</body>

</html>

```

### **Lampiran 3. Connectdb.php.**

```
<?php
```

```
$dbname = 'data';
```

```
$dbuser = 'data';
```

```
$dbpass = 'mintaijinmasuk';
```

```
$dbhost = 'localhost';
```

```
$connect = @mysqli_connect($dbhost,$dbuser,$dbpass,$dbname);
```

```
?>
```

## Lampiran 4. getData.php

```
<?php
header('Content-Type: application/json');
header('Access-Control-Allow-Origin: *');
include 'connectdb.php';

$sensor_id = $_GET['id'];
$query = "SELECT * FROM $sensor_id ORDER BY id desc LIMIT 450;";
$result = mysqli_query($connect,$query);

$data = $array = $reverse = array();
foreach($result as $row){
    $data['date'] = $row['date'];
    $data['rate'] = $row['rate'];
    $data['totaliser'] = $row['totaliser'];
    array_push($array, $data);
}

foreach($array as $key => $row){
    $date[$key] = $row['date'];
    $rate[$key] = $row['rate'];
    $totaliser[$key] = $row['totaliser'];
}
$reverse = array_reverse($array);
echo json_encode($reverse);
?>
```

## Lampiran 5. singleData.php.

```
<?php
header('Content-Type: application/json');
header('Access-Control-Allow-Origin: *');
include 'connectdb.php';

$sensor_id = $_GET['id'];
$query = "SELECT * FROM $sensor_id ORDER BY id desc LIMIT 1;";
$result = mysqli_query($connect,$query);

$data = $array = $reverse = array();
foreach($result as $row){
    $data['date'] = $row['date'];
    $data['rate'] = $row['rate'];
    array_push($array, $data);
}
$reverse = array_reverse($array);
echo json_encode($reverse);
?>
```

## Lampiran 6. connect.php

```
<html>
<body>
<?php
include 'connectdb.php';
$dbname = 'data';
$dbuser = 'data';
$dbpass = 'mintaijinmasuk';
$dbhost = 'localhost';
$connect = @mysqli_connect($dbhost,$dbuser,$dbpass,$dbname);
if(!$connect){
    echo "Error: " . mysqli_connect_error();
    exit();
}
echo "Connection Success!<br><br>";

$rate = $_GET["rate"];
$totaliser = $_GET["totaliser"];
$pulsa = $_GET["pulsa"];
$sensor_id = $_GET['id'];
$query = "INSERT INTO $sensor_id (rate, totaliser, pulsa) VALUES ('$rate',
'$totaliser', '$pulsa')";
$result = mysqli_query($connect,$query);
echo "Insertion Success!<br>";
?>
</body>
</html>
```

## Lampiran 7. chart.js

```
function getajax(name) {
  var url = "http://192.168.1.100/monitoring/getData.php?id="+name;
  return new Promise(function(resolve, reject) {
    var xhr = new XMLHttpRequest();
    xhr.onload = function() {
      resolve(this.responseText);
    };
    xhr.onerror = reject;
    xhr.open('GET', url);
    xhr.send();
  });
}

function singleData(name) {
  var url = "http://192.168.1.100/monitoring/singleData.php?id="+name;
  return new Promise(function(resolve, reject) {
    var xhr = new XMLHttpRequest();
    xhr.onload = function() {
      resolve(this.responseText);
    };
    xhr.onerror = reject;
    xhr.open('GET', url);
    xhr.send();
  });
}

var root = am5.Root.new("chartdiv");

root.setThemes([
  am5themes_Animated.new(root)
]);

var chart = root.container.children.push(
  am5xy.XYChart.new(root, {
    focusable: true
  })
);

var easing = am5.ease.linear;
chart.get("colors").set("step", 3);

var xAxis = chart.xAxes.push(
  am5xy.DateAxis.new(root, {
    maxDeviation: 10,
    groupData: true,
    baseInterval: {
      timeUnit: "second",
      count: 1
    }
  })
);
```

```

    },

    categoryField: "category",
    tooltipDateFormat: "yyyy-MM-dd HH:mm:ss",
    renderer: am5xy.AxisRendererX.new(root, {}),
    tooltip: am5.Tooltip.new(root, {})
  })
);

var cursor = chart.set("cursor", am5xy.XYCursor.new(root, {
  xAxis: xAxis,
  behavior: "none"
}));
cursor.lineY.set("visible", false);

function createAxisAndSeriesV1(rawData, opposite, sensor) {
  var test;
  test = JSON.parse(rawData);
  var convertData = [];
  for (var i = 0; i < test.length; i++) {

    convertData.push({
      date: test[i].date,
      rate: parseFloat( test[i].rate),
    });
  console.log(convertData);
  var yRenderer = am5xy.AxisRendererY.new(root, {
    opposite: opposite
  });
  var yAxis = chart.yAxes.push(
    am5xy.ValueAxis.new(root, {
      maxDeviation: 0.1,
      renderer: yRenderer
    })
  );

  var series = chart.series.push(
    am5xy.LineSeries.new(root, {
      name: sensor,
      xAxis: xAxis,
      yAxis: yAxis,
      valueYField: "rate",
      valueXField: "date",
      categoryXField: sensor,
      tooltip: am5.Tooltip.new(root, {
        pointerOrientation: "horizontal",
        labelText: "[bold]{name}[/]\n{categoryX}: {valueY}"
      })
    })
  );

  series.strokes.template.setAll({ strokeWidth: 1 });
}

```



```

yRenderer.grid.template.set("strokeOpacity", 0.05);
yRenderer.labels.template.set("fill", series.get("fill"));
yRenderer.setAll({
    stroke: series.get("fill"),
    strokeOpacity: 1,
    opacity: 1
});

series.data.processor = am5.DataProcessor.new(root, {
    dateFormat: "yyyy-MM-dd HH:mm:ss",
    dateFields: ["date"]
});

series.data.setAll(convertData);
setInterval(function () {
    singleData(sensor).then(function(result) {
        addData(series,result,sensor);
    }).catch(function() {
        // An error occurred
    });
}, 1000)
}

getajax("sensor1").then(function(result) {
    createAxisAndSeriesV1(result, true, "sensor1");
}).catch(function() {
});

getajax("sensor2").then(function(result) {
    createAxisAndSeriesV1(result, true, "sensor2");
}).catch(function() {
});

getajax("sensor3").then(function(result) {
    createAxisAndSeriesV1(result, true, "sensor3");
}).catch(function() {
});

var legend = chart.children.push(am5.Legend.new(root, {
    nameField: "categoryX",
    centerX: am5.percent(50),
    x: am5.percent(50)
}));

legend.data.setAll(series.dataItems);

function addData(series,rawData,sensor) {
    var test;
    test = JSON.parse(rawData);
    // console.log(test);
}

```

```

var convertData = [];
for (var i = 0; i < test.length; i++) {

    convertData.push({
        date: test[i].date,
        rate: parseFloat( test[i].rate),
        totaliser: parseFloat( test[i].totaliser)
    });

var lastDataItem = series.dataItems[series.dataItems.length - 1];
var lastValue = lastDataItem.get("valueY");
var newValue = parseFloat(convertData[0].rate);
var time = convertData[0].date;
document.getElementById(sensor).innerHTML = newValue+" L/min";
console.log(convertData);
series.data.removeIndex(0);
series.data.push({
    date: time,
    value: newValue
})

var newDataItem = series.dataItems[series.dataItems.length - 1];
newDataItem.animate({
    key: "valueYWorking",
    to: newValue,
    from: lastValue,
    duration: 600,
    easing: easing
});

var animation = newDataItem.animate({
    key: "locationX",
    to: 1,
    from: -1,
    duration: 600
});
if (animation) {
    var tooltip = xAxis.get("tooltip");
    if (tooltip && !tooltip.isHidden()) {
        animation.events.on("stopped", function () {
            xAxis.updateTooltip();
        })
    }
}
}
chart.appear(1000, 100);

```