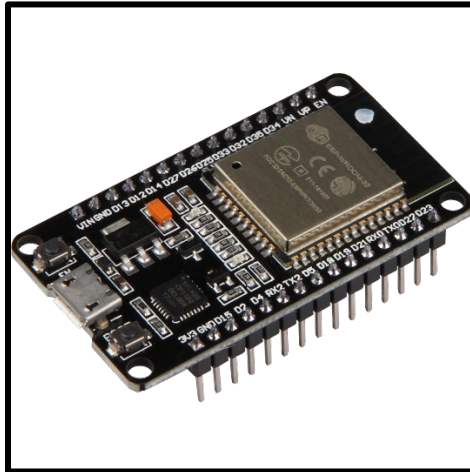




## DESCRIPTION

This project to show how to monitor the data using NodeMCU with Favoriot platform. This project used ESP32 NodeMCU as a wifi module and data read from DS18B20 as a temperature sensor. FAVORIOT as a middleware platform that can show the realtime data on dashboard.

# COMPONENTS



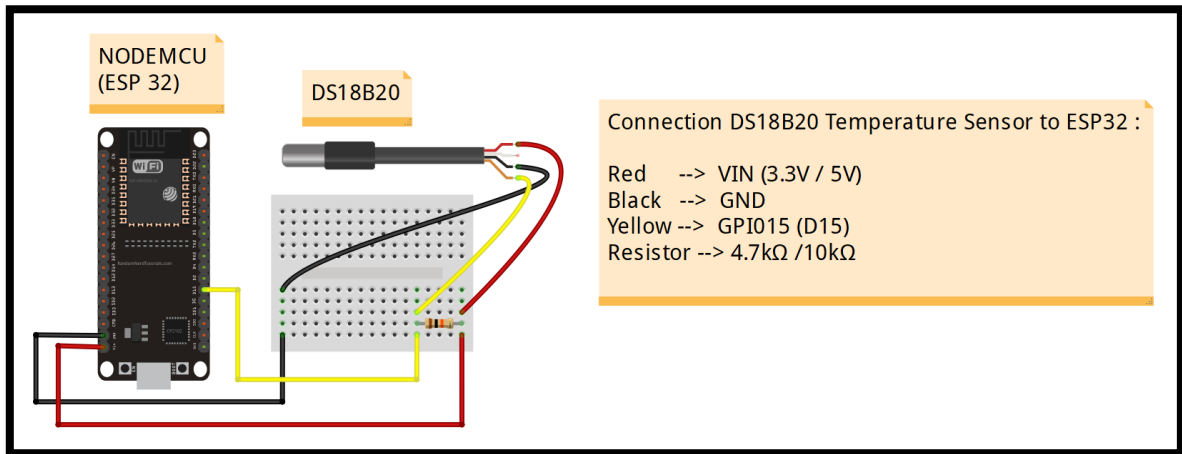
Node MCU ESP32



DS18B20 WATERPOOF TEMPERATURE SENSOR

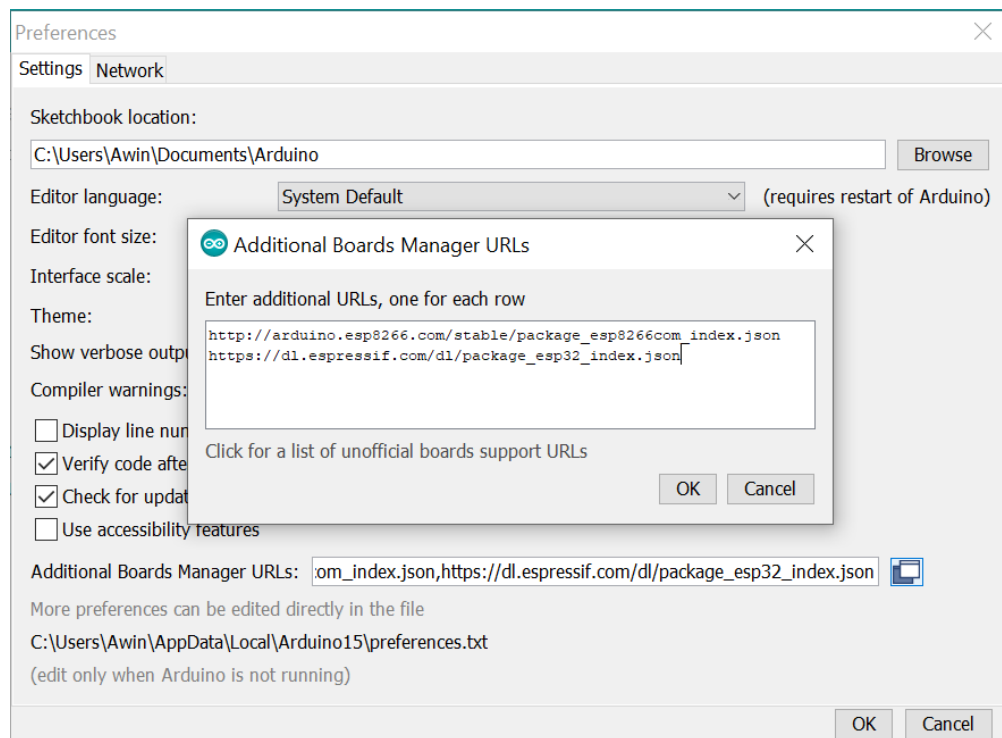
# SCHEMATIC DIAGRAM

1. Construct the circuit as shown in diagram below:

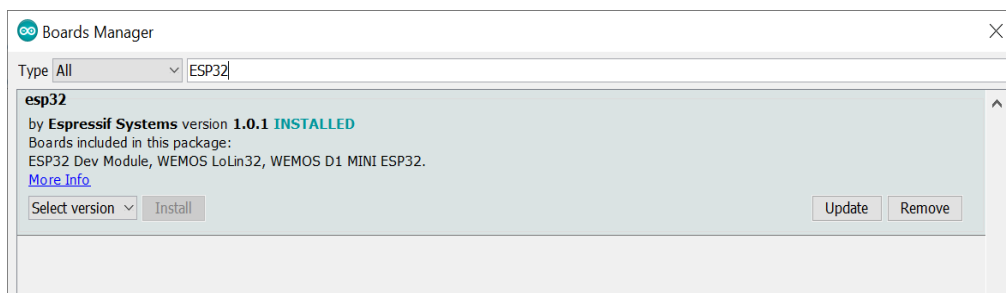


# SETUP ARDUINO IDE

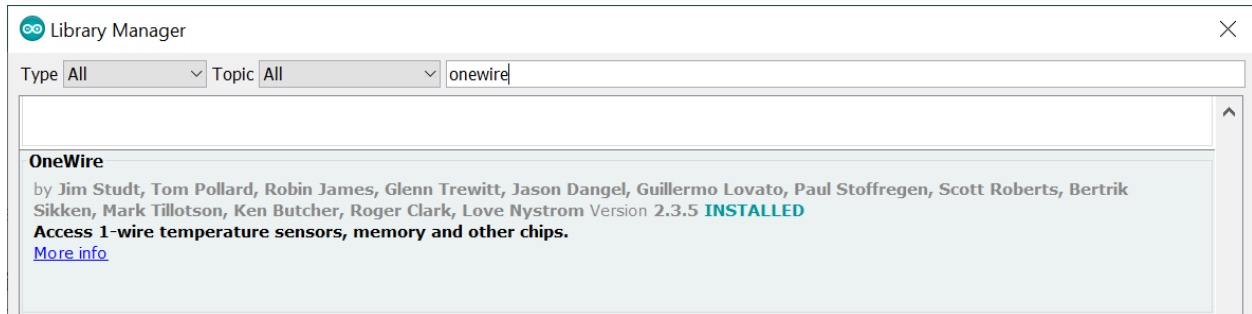
1. Connect ESP32 board using USB MicroB cable to your USB port on your computer.
2. Open the Arduino IDE software > File > Preferences > Additional Board Manager URLs > [https://dl.espressif.com/dl/package\\_esp32\\_index.json](https://dl.espressif.com/dl/package_esp32_index.json) > Click OK



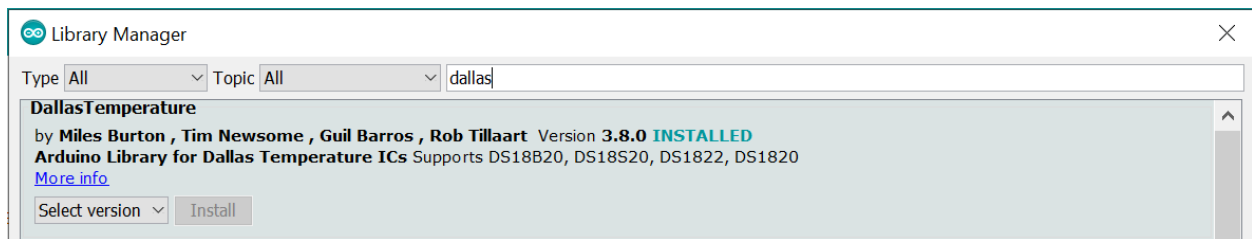
3. At Arduino IDE software > Tools > Board > Boards Manager > Search ESP32, then installed



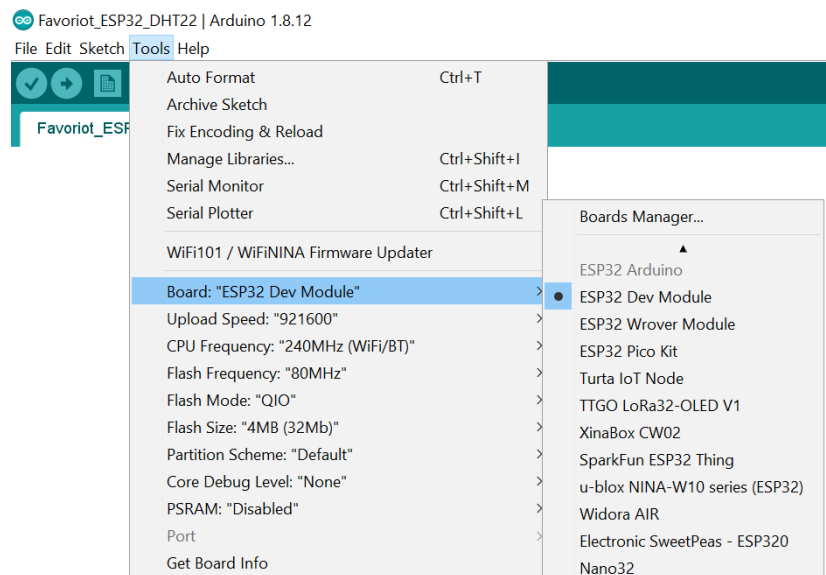
- At Arduino IDE software > Sketch > Include Library > Manage Libraries > Search OneWire, then installed



- At Arduino IDE software > Sketch > Include Library > Manage Libraries > Search Dallas Temperature, then installed



- At Arduino IDE software > Tools > Board > ESP32 Dev Module and Port



- Then, write the completed code.

## WRITE THE CODE

This is a combine code from Arduino program and FAVORIOT platform. The data will be retrieved from the sensor and will be displayed on the FAVORIOT platform in realtime. Here, the completed code for Arduino code.

```
#include <WiFi.h>
#include <HTTPClient.h>
#include <ArduinoJson.h>
#include <OneWire.h>
#include <DallasTemperature.h>

#define APIKEY " Your API key "           //replace API key
#define DEVICE_DEV_ID " Your device developer ID " //replace device developer ID
#define ONE_WIRE_BUS 15 //DS18B20 data wire is connected to pin 15 on the NodeMCU

OneWire oneWire(ONE_WIRE_BUS);
DallasTemperature sensors(&oneWire);

const char ssid[] = " Your wifi SSID "; //replace wifi SSID
const char password[] = " Your Wifi Password"; //replace wifi password

unsigned long int timer;
long previousMillis = 0;
int interval = 10000; // 10 seconds

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

  WiFi.mode(WIFI_STA);
  Serial.print("Connecting to ");
  Serial.print(ssid);
  WiFi.begin(ssid, password);
  while (WiFi.status() != WL_CONNECTED) {
    delay(5000);
    Serial.print(".");
  }

  Serial.println("Connected!");
  Serial.print("IP Address: ");
  Serial.println(WiFi.localIP());
}
```

```

void loop()
{
  if (millis() - previousMillis > interval)
  {
    sensors.requestTemperatures();
  }

  Serial.println("Requesting temperatures: ");
  Serial.println("Celcius Temperature="+String(sensors.getTempCByIndex(0))+ "degC - Fahrenheit
  Temperature="+String(sensors.getTempFByIndex(0))+ "F");

  StaticJsonDocument<200> doc;

  JsonObject root = doc.to<JsonObject>(); // Json Object refer to { }
  root["device_developer_id"] = DEVICE_DEV_ID;

  JsonObject data = root.createNestedObject("data");
  data["Celcius Temperature"] = sensors.getTempCByIndex(0);
  data["Fahrenheit Temperature"] = sensors.getTempFByIndex(0);

  String body;
  serializeJson(root, body);
  Serial.println(body);

  HTTPClient http;

  http.begin("http://apiv2.favoriot.com/v2/streams");
  http.addHeader("Content-Type", "application/json");
  http.addHeader("Apikey", APIKEY);

  int httpCode = http.POST(body);
  if (httpCode > 0) {
    Serial.printf("[HTTP] POST... code: %d\n", httpCode);
    if (httpCode == HTTP_CODE_OK) {
      String payload = http.getString();
      Serial.println(payload);
    }
  }
  else {
    Serial.printf("[HTTP] POST... failed, error: %s\n", http.errorToString(httpCode).c_str());
  }
  http.end();

  previousMillis = millis();
  delay(10000);
}

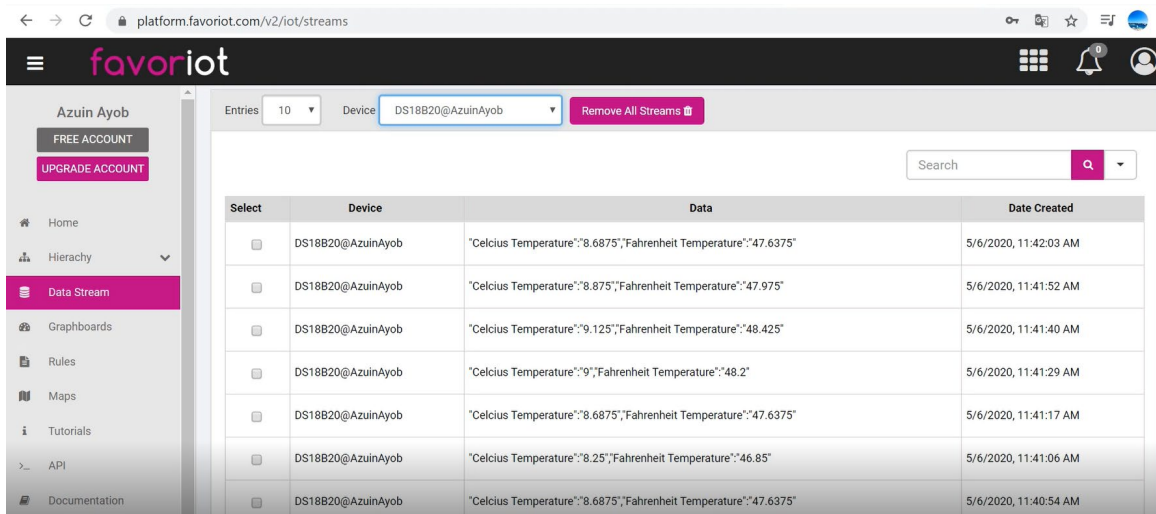
```

# RESULT

Once finished, click on the Verify button and Upload code to board. The output will be display on Serial Monitor.

```
11:39:34.189 -> [HTTP] POST... code: 201
11:39:44.277 -> Requesting temperatures:
11:39:44.313 -> Celcius Temperature=10.94degC - Fahrenheit Temperature=51.69F
11:39:44.385 -> {"device_developer_id":"DS18B20@AzuinAyob","data":{"Celcius Temperature":10.9375,"Fahrenheit Temperature":51.6875}}
11:39:46.257 -> [HTTP] POST... code: 201
11:39:56.343 -> Requesting temperatures:
11:39:56.412 -> Celcius Temperature=9.88degC - Fahrenheit Temperature=49.78F
11:39:56.487 -> {"device_developer_id":"DS18B20@AzuinAyob","data":{"Celcius Temperature":9.875,"Fahrenheit Temperature":49.775}}
11:39:57.927 -> [HTTP] POST... code: 201
11:40:08.016 -> Requesting temperatures:
11:40:08.088 -> Celcius Temperature=9.19degC - Fahrenheit Temperature=48.54F
11:40:08.159 -> {"device_developer_id":"DS18B20@AzuinAyob","data":{"Celcius Temperature":9.1875,"Fahrenheit Temperature":48.5375}}
11:40:09.196 -> [HTTP] POST... code: 201
11:40:19.276 -> Requesting temperatures:
11:40:19.348 -> Celcius Temperature=9.13degC - Fahrenheit Temperature=48.42F
11:40:19.417 -> {"device_developer_id":"DS18B20@AzuinAyob","data":{"Celcius Temperature":9.125,"Fahrenheit Temperature":48.425}}
11:40:21.066 -> [HTTP] POST... code: 201
11:40:31.155 -> Requesting temperatures:
11:40:31.223 -> Celcius Temperature=9.00degC - Fahrenheit Temperature=48.20F
11:40:31.292 -> {"device_developer_id":"DS18B20@AzuinAyob","data":{"Celcius Temperature":9,"Fahrenheit Temperature":48.2}}
11:40:32.124 -> [HTTP] POST... code: 201
11:40:42.244 -> Requesting temperatures:
11:40:42.286 -> Celcius Temperature=8.81degC - Fahrenheit Temperature=47.86F
11:40:42.347 -> {"device_developer_id":"DS18B20@AzuinAyob","data":{"Celcius Temperature":8.8125,"Fahrenheit Temperature":47.8625}}
11:40:43.617 -> [HTTP] POST... code: 201
11:40:53.693 -> Requesting temperatures:
11:40:53.762 -> Celcius Temperature=8.69degC - Fahrenheit Temperature=47.64F
11:40:53.830 -> {"device_developer_id":"DS18B20@AzuinAyob","data":{"Celcius Temperature":8.6875,"Fahrenheit Temperature":47.6375}}
```

Open FAVORIOT platform at browser, click at Data Stream and select a device. The output will be displayed as shown below.



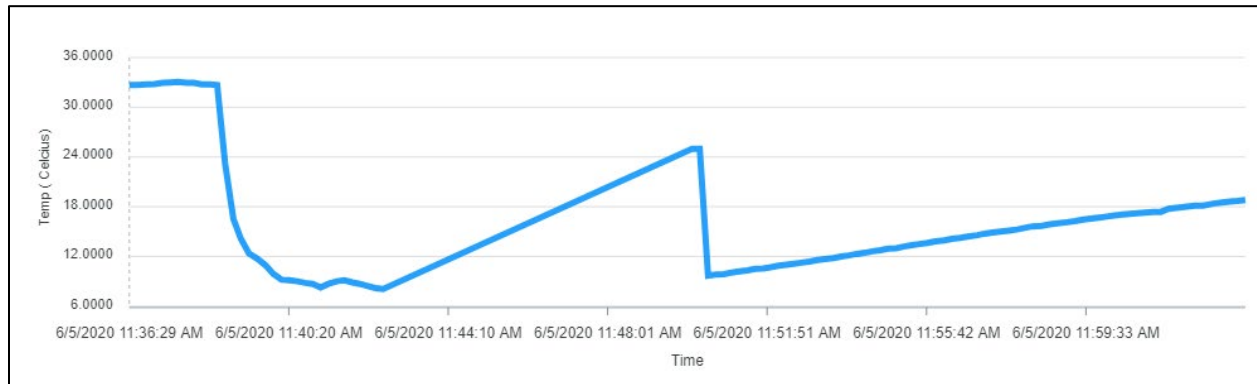
The screenshot shows the FAVORIOT platform interface. On the left is a sidebar with navigation options: Home, Hierarchy, Data Stream (selected), Graphboards, Rules, Maps, Tutorials, API, and Documentation. The main area displays the 'Data Stream' for device 'DS18B20@AzuinAyob'. It includes a search bar and a table with the following data:

Select	Device	Data	Date Created
<input type="checkbox"/>	DS18B20@AzuinAyob	"Celcius Temperature":8.6875,"Fahrenheit Temperature":47.6375"	5/6/2020, 11:42:03 AM
<input type="checkbox"/>	DS18B20@AzuinAyob	"Celcius Temperature":8.875,"Fahrenheit Temperature":47.975"	5/6/2020, 11:41:52 AM
<input type="checkbox"/>	DS18B20@AzuinAyob	"Celcius Temperature":9.125,"Fahrenheit Temperature":48.425"	5/6/2020, 11:41:40 AM
<input type="checkbox"/>	DS18B20@AzuinAyob	"Celcius Temperature":9,"Fahrenheit Temperature":48.2"	5/6/2020, 11:41:29 AM
<input type="checkbox"/>	DS18B20@AzuinAyob	"Celcius Temperature":8.6875,"Fahrenheit Temperature":47.6375"	5/6/2020, 11:41:17 AM
<input type="checkbox"/>	DS18B20@AzuinAyob	"Celcius Temperature":8.25,"Fahrenheit Temperature":46.85"	5/6/2020, 11:41:06 AM
<input type="checkbox"/>	DS18B20@AzuinAyob	"Celcius Temperature":8.6875,"Fahrenheit Temperature":47.6375"	5/6/2020, 11:40:54 AM

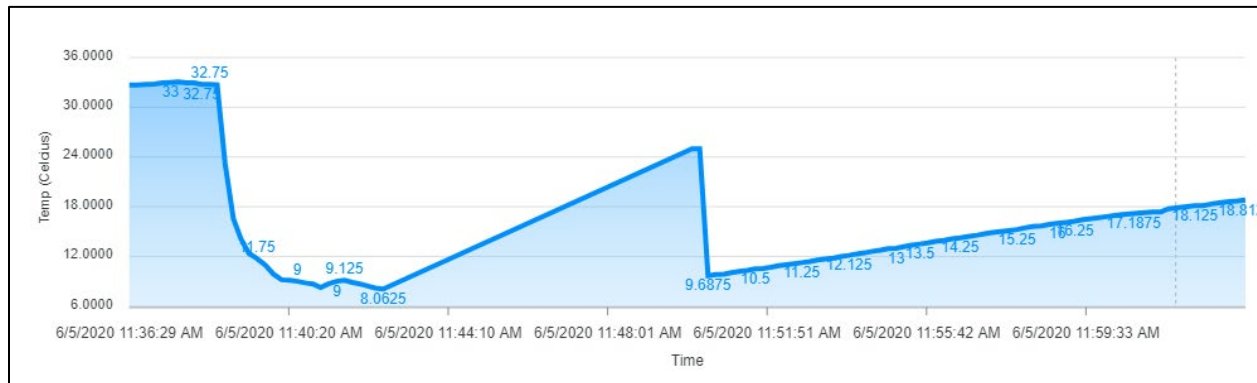


At graphboard can create various graph such as line, area, bar etc as shown below.

### Line Graph



### Area Graph



### Bar Graph

