Environment Monitoring System

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**Overview: Send Real-Time Sensor Data to Google Firebase with ESP8266**

Earlier when there was no development of IoT, the remote monitoring of sensor data was limited. The device used to be placed near the observer to check the data on display devices. Since the advancement of IoT, the limitations have been removed and data monitoring remotely has been possible. Not only the monitoring of data remotely but also monitoring the data on a real-time basis has become possible.

So we are basically focusing on IoT Based Remote Data Monitoring System. In some of our earlier projects, we used the IoT platforms like Thingspeak, Adafruit.io & Webpage to monitor data remotely using Nodemcu ESP8266. But in this project, we will Send the Real-Time Sensor Data to Google Firebase with ESP8266 & DHT11 Humidity Temperature Sensor. The data will be read using DHT11 Sensor and sent to Google Firebase Console Database.

Google Firebase is a Google-backed application development software used for creating, managing,and modifying data generated from any android/IOS application, web services, IoT sensors & Hardware. To learn more about the Google Firebase Console, you can read the official Google Firebase Documentation from Google Firebase

**Components List**

|  |  |  |
| --- | --- | --- |
| 1 | NodeMCU ESP8266 Board |  |
| 2 | DHT11 Sensor |  |  |
| 3 | Micro-USB Cable |  |  |
| 4 | Jumper Wires |  |  |
| 5 | Breadboard |  |  |

**Code –**

void loop()

{

  float h = dht.readHumidity();                                 // Read Humidity

  float t = dht.readTemperature();                              // Read temperature

  if (isnan(h) || isnan(t))                                     // Checking sensor working

  {

    Serial.println(F("Failed to read from DHT sensor!"));

    return;

  }

  Serial.print("Humidity: ");

  Serial.print(h);

  String fireHumid = String(h) + String("%");                   //Humidity integer to string conversion

  Serial.print("%  Temperature: ");

  Serial.print(t);

  Serial.println("°C ");

  String fireTemp = String(t) + String("°C");                  //Temperature integer to string conversion

  delay(5000);

  Firebase.pushString("/DHT11/Humidity", fireHumid);            //setup path to send Humidity readings

  Firebase.pushString("/DHT11/Temperature", fireTemp);         //setup path to send Temperature readings

    if (Firebase.failed())

    {

      Serial.print("pushing /logs failed:");

      Serial.println(Firebase.error());

      return;

} }

#include <ESP8266WiFi.h>

#include <FirebaseArduino.h>

#include <DHT.h>

#define FIREBASE\_HOST "\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*.firebaseio.com"

#define FIREBASE\_AUTH "\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*"

#define WIFI\_SSID "\*\*\*\*\*\*\*\*\*\*\*"

#define WIFI\_PASSWORD "\*\*\*\*\*\*\*\*\*\*\*\*\*\*"

#define DHTPIN D2                                            // Digital pin connected to DHT11

#define DHTTYPE DHT11                                        // Initialize dht type as DHT 11

DHT dht(DHTPIN, DHTTYPE);

void setup()

{

  Serial.begin(115200);

  dht.begin();                                                  //reads dht sensor data

  WiFi.begin(WIFI\_SSID, WIFI\_PASSWORD);

  Serial.print("Connecting to ");

  Serial.print(WIFI\_SSID);

  while (WiFi.status() != WL\_CONNECTED) {

    Serial.print(".");

    delay(500);

  }

  Serial.println();

  Serial.print("Connected");

  Serial.print("IP Address: ");

  Serial.println(WiFi.localIP());                               //prints local IP address

  Firebase.begin(FIREBASE\_HOST, FIREBASE\_AUTH);                 // connect to the firebase

}



