**WEATHER FORECAST AND REAL TIME MONITORING:**

**IoT-Based Weather & Gas Monitoring System (ESP32 + Blynk)**

This project monitors:

* Temperature
* Humidity
* Gas concentration

**Step 1: Components Required**

|  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- |
| | **Component** | **Quantity** | **Notes** | | --- | --- | --- | | ESP32 | 1 | Wi-Fi microcontroller | | DHT22 Sensor | 1 | Measures temperature/humidity | | MQ2 Sensor | 1 | Detects gas/smoke | | Jumper Wires | - |  | | Breadboard | Optional | For easy connections | |

**Step 2: Blynk Cloud & App Setup**

1. Go to <https://blynk.cloud> → Login/Register
2. Create a new **Template**:
   * Name: Environment Monitor
   * Board: ESP32
   * Connection: Wi-Fi

Add **Data streams**:

|  |  |  |  |  |  |  |  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- |
| | **Name** | **Type** | **Virtual Pin** | | --- | --- | --- | | Temperature | Double | V2 | | Humidity | Double | V1 | | Gas Level | Integer | V0 | |

1. Copy:
   * **BLYNK\_TEMPLATE\_ID**
   * **BLYNK\_TEMPLATE\_NAME**
   * **BLYNK\_AUTH\_TOKEN**
2. In the **Blynk mobile app**:
   * Create a device from the template
   * Add 3 **Gauge** or **Label** widgets → Link them to V0, V1, and V2

**Step 3: Circuit Connections**

| **Sensor** | **Pin** | **ESP32 Pin** |
| --- | --- | --- |
| DHT22 | VCC | 3.3V |
|  | GND | GND |
|  | DATA | GPIO 4 |
| MQ-2 | VCC | 3.3V or 5V |
|  | GND | GND |
|  | A0 (analog) | GPIO 34 |

**Step 4: Arduino Code**

**Install Libraries:**

* Blynk
* DHT 22
* MQ2

**Done!**

* Upload the code to ESP32.
* Open Serial Monitor.
* Open the Blynk app — you'll see live **Temperature, Humidity, and Gas Levels**.

Code:

#define BLYNK\_TEMPLATE\_ID "TMPL3mneoOQN1"

#define BLYNK\_TEMPLATE\_NAME "WEATHER"

#define BLYNK\_AUTH\_TOKEN "FdvJHlY1WJ1sPa17YSUHxXrZ1sDCoOhD"

#include <WiFi.h>

#include <WiFiClient.h>

#include <BlynkSimpleEsp32.h>

#include <DHT.h>

char ssid[] = "Wokwi-GUEST";

char pass[] = "";

#define DHTPIN 15

#define MQ2PIN 34

#define DHTTYPE DHT22

DHT dht(DHTPIN, DHTTYPE);

BlynkTimer timer;

void sendSensorData() {

  float temp = dht.readTemperature();

  float hum = dht.readHumidity();

  int gas = analogRead(MQ2PIN);

  Blynk.virtualWrite(V2, temp);

  Blynk.virtualWrite(V1, hum);

  Blynk.virtualWrite(V0, gas);

  if (gas > 600) Blynk.logEvent("report", "Gas level high!");

  Serial.print("Temp: ");

  Serial.print(temp);

  Serial.print(" °C | Hum: ");

  Serial.print(hum);

  Serial.print(" % | Gas: ");

  Serial.println(gas);

}

void setup() {

  Serial.begin(115200);

  Blynk.begin(BLYNK\_AUTH\_TOKEN, ssid, pass);

  dht.begin();

  timer.setInterval(10000L, sendSensorData);

}

void loop() {

  Blynk.run();

  timer.run();

}

Output:

