

```

#include <DHT.h>
#include <Wire.h>
#include <LiquidCrystal_I2C.h>

#if defined(ESP32)
#include <WiFi.h>
#include <FirebaseESP32.h>
#elif defined(ESP8266)
#include <ESP8266WiFi.h>
#include <FirebaseESP8266.h>
#endif

#include <addons/TokenHelper.h>
#include <addons/RTDBHelper.h>

// ----- CONFIG SECTION ----- //
#define DHTPIN 2 // DHT sensor data pin (GPIO2)
#define DHTTYPE DHT11 // Use DHT22 if needed
#define WATER_SENSOR_PIN A0 // Analog water level sensor pin

#define WIFI_SSID "PMorey"
#define WIFI_PASSWORD "123456789"

#define API_KEY "AIzaSyAZDU5OW7NEKnekyrF3darB6-COarcAqws"
#define DATABASE_URL
"https://iot-project-ce8c0-default-rtdb.firebaseio.com/"

#define USER_EMAIL "pritam.morey.btech2022@sitnagpur.siu.edu.in"
#define USER_PASSWORD "123456"
// ----- //

// Firebase & DHT Setup
FirebaseData fbdo;
FirebaseAuth auth;
FirebaseConfig config;
DHT dht(DHTPIN, DHTTYPE);

// LCD Setup: 0x27 is the default I2C address for many LCDs
LiquidCrystal_I2C lcd(0x27, 16, 2);

// Firebase update timer
unsigned long sendDataPrevMillis = 0;
const long interval = 5000; // 5 seconds

void setup() {
  Serial.begin(115200);
  dht.begin();
  Wire.begin(4, 5); // SDA = D2, SCL = D1

  lcd.init();
  lcd.backlight();
  lcd.clear();
  lcd.setCursor(0, 0);
  lcd.print("Starting...");
}

```

```

WiFi.begin(WIFI_SSID, WIFI_PASSWORD);
Serial.print("Connecting to Wi-Fi");
while (WiFi.status() != WL_CONNECTED) {
    Serial.print(".");
    delay(300);
}

Serial.println();
Serial.print("Connected with IP: ");
Serial.println(WiFi.localIP());
Serial.println();

lcd.clear();
lcd.setCursor(0, 0);
lcd.print("WiFi Connected");

Serial.printf("Firebase Client v%s\n\n",
FIREBASE_CLIENT_VERSION);

config.api_key = API_KEY;
config.database_url = DATABASE_URL;
auth.user.email = USER_EMAIL;
auth.user.password = USER_PASSWORD;
config.token_status_callback = tokenStatusCallback;

Firebase.begin(&config, &auth);
Firebase.reconnectWiFi(true);
Firebase.setDoubleDigits(5);

delay(2000);
lcd.clear();
}

void loop() {
    if (Firebase.ready() && millis() - sendDataPrevMillis >
interval) {
        sendDataPrevMillis = millis();

        // --- Read Sensor Data --- //
        float temp = dht.readTemperature();
        float hum = dht.readHumidity();
        int waterLevel = analogRead(WATER_SENSOR_PIN);

        // Check for sensor read errors
        if (isnan(temp) || isnan(hum)) {
            Serial.println("Failed to read from DHT sensor!");
            return;
        }

        String levelStatus = "Unknown";
        if (waterLevel > 500) {
            levelStatus = "Full";
        } else if (waterLevel > 300) {

```

```

        levelStatus = "Mid";
    } else {
        levelStatus = "Empty";
    }

    // --- Print to Serial Monitor --- //
    Serial.println("Uploading to Firebase...");
    Serial.print("Temperature: "); Serial.println(temp);
    Serial.print("Humidity: "); Serial.println(hum);
    Serial.print("Water Level Value: ");
Serial.println(waterLevel);
    Serial.print("Water Status: "); Serial.println(levelStatus);

    // --- Display on LCD --- //
    lcd.clear();
    lcd.setCursor(0, 0);
    lcd.print("T:"); lcd.print(temp, 1); lcd.print("C ");
    lcd.print("H:"); lcd.print(hum, 0); lcd.print("%");

    lcd.setCursor(0, 1);
    lcd.print("W:"); lcd.print(waterLevel);
    lcd.print(" "); lcd.print(levelStatus);

    // --- Push to Firebase --- //
    Firebase.setFloat(fbdo, "/tank/temperature", temp);
    Firebase.setFloat(fbdo, "/tank/humidity", hum);
    Firebase.setInt(fbdo, "/tank/waterLevelValue", waterLevel);
    Firebase.setString(fbdo, "/tank/status", levelStatus);
}
}

```