

SOFTWARE CODE

```
/*
////////// How to read int value from firebase //////////

int Motor =0;
Firebase.RTDB.getInt(&fbdo, "Data/Motor", &Motor);
Serial.println("Motor");
Serial.println(Motor);

*/

#include <Arduino.h>
#include <WiFi.h>           //we are using the ESP32
#include <Firebase_ESP_Client.h>
#include <DHT.h>           // Install DHT library by adafruit 1.3.8
#include <LiquidCrystal.h>

#define DHT_SENSOR_PIN 5
#define DHT_SENSOR_TYPE DHT11
int MOISTURE_PIN = 32;
const int buttonPin = 35;
int buttonState = 1;
#define trigger 15
#define echo 2
int Motor_ON=0;
int count=0;

const int rs = 13, en = 12, d4 = 14, d5 = 27, d6 = 26, d7 = 25;
LiquidCrystal lcd(rs, en, d4, d5, d6, d7);

//To provide the ESP32 / ESP8266 with the connection and the sensor type
DHT dht_sensor(DHT_SENSOR_PIN, DHT_SENSOR_TYPE);

//Provide the token generation process info.
#include "addons/TokenHelper.h"
//Provide the RTDB payload printing info and other helper functions.
#include "addons/RTDBHelper.h"

// Insert your network credentials
#define WIFI_SSID "One Plus" //Redmi 9 Power One Plus
#define WIFI_PASSWORD "Rajashreed" //Rajashreed

// Insert Firebase project API Key
#define API_KEY "AlzaSyDyVRrR-60F_fYQRm_JEzoWwo1n1_haUlk"

// Insert RTDB URLdefine the RTDB URL */
#define DATABASE_URL "https://data-bd0f5-default-rtdb.firebaseio.com/" //https://data-bd0f5-
```

default-rtdb.firebaseio.com/

```
//Define Firebase Data object
```

```
FirebaseData fbdo;
```

```
FirebaseAuth auth;
```

```
FirebaseConfig config;
```

```
unsigned long sendDataPrevMillis = 0;
```

```
bool signupOK = false;           //since we are doing an anonymous sign in
```

```
unsigned int Moisture,Level;
```

```
int Time=0;
```

```
int distance=0;
```

```
int moisture_analog=0;
```

```
int Tank_Motor= 33; //33
```

```
int Agri_Motor= 23;
```

```
String Motor;
```

```
void setup()
```

```
{
```

```
  pinMode(trigger,OUTPUT);
```

```
  pinMode(echo,INPUT);
```

```
  pinMode(Tank_Motor,OUTPUT);
```

```
  pinMode(Agri_Motor,OUTPUT);
```

```
  digitalWrite(Tank_Motor,LOW);
```

```
  digitalWrite(Agri_Motor,LOW);
```

```
  pinMode(buttonPin, INPUT_PULLUP);
```

```
  dht_sensor.begin();
```

```
  lcd.begin(16, 2);
```

```
  lcd.clear();
```

```
  lcd.setCursor(3, 0);
```

```
  lcd.print("IoT Based");
```

```
  lcd.setCursor(0, 1);
```

```
  lcd.print("Vertical Farming");
```

```
  Serial.begin(9600);
```

```
  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();

/* Assign the api key (required) */
config.api_key = API_KEY;

/* Assign the RTDB URL (required) */
config.database_url = DATABASE_URL;

/* Sign up */
if (Firebase.signUp(&config, &auth, "", "")){
  Serial.println("ok");
  signupOK = true;
}
else{
  Serial.printf("%s\n", config.signer.signupError.message.c_str());
}

/* Assign the callback function for the long running token generation task */
config.token_status_callback = tokenStatusCallback; //see addons/TokenHelper.h

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

lcd.clear();
}

void loop()
{

  //temperature and humidity measured should be stored in variables so the user
  //can use it later in the database
  int temperature = dht_sensor.readTemperature();
  int humidity = dht_sensor.readHumidity();
  buttonState = digitalRead(buttonPin);

  //////////////////////////////////////
  //////////////////////////////////////
  // MOISTURE //
  //////////////////////////////////////
  //////////////////////////////////////
  moisture_analog = analogRead(MOISTURE_PIN);
  int percent= 100- (map(moisture_analog, 1500, 4099, 0, 100));

  /* if(percent<30)
  {
    digitalWrite(Agri_Motor ,HIGH);
  }

```

```

}
else
{
    digitalWrite(Agri_Motor ,LOW);
}
*/
Serial.println(buttonState);

////////////////////////////////////
////////////////////////////////////
// ULTRASONIC //
////////////////////////////////////
////////////////////////////////////
digitalWrite(trigger,LOW);
delayMicroseconds(2);
digitalWrite(trigger,HIGH);
delayMicroseconds(10);
digitalWrite(trigger,LOW);
delayMicroseconds(2);
Time=pulseIn(echo,HIGH);
distance=Time*340/20000;
Level= (distance*100)/60;

if(Level >= 100)
{
    Level=0;
}
else
{
    Level=100-Level;
}

if(Level<30)
{
    digitalWrite(Tank_Motor,HIGH);
    Motor_ON=1;
}
else if((Level>80) && (Motor_ON ==1) )
{
    digitalWrite(Tank_Motor,LOW);
    Motor_ON=0;
}
else if(Motor_ON==0)
{
    digitalWrite(Tank_Motor,LOW);
}

```



```

    {
        Motor = fbdo.intData();
        Serial.println(Motor);
        Serial.println(count++);
    }
*/

if(Firebase.RTDB.getString(&fbdo, "Data/Motor", &Motor))
{
    Serial.println("Motor");
    Serial.println(Motor);
    Serial.println(count++);

    if(Motor== "1")
    {
        digitalWrite(Agri_Motor,HIGH);
        Serial.println(count++);
    }

    if(Motor== "0")
    {
        digitalWrite(Agri_Motor,LOW);
    }
}
else
{

/////Enter Temperature in to the DHT_11 Table
if (Firebase.RTDB.setInt(&fbdo, "Data/Temp", temperature))
{

}

/////Enter Humidity in to the DHT_11 Table
if (Firebase.RTDB.setFloat(&fbdo, "Data/Humidity", humidity))
{

}

/////Enter Water Level
if (Firebase.RTDB.setInt(&fbdo, "Data/Level", Level))

```

```
{  
  
}
```

```
/////Enter Moisture  
if (Firebase.RTDB.setInt(&fbdo, "Data/Moisture", percent))  
{  
  
}
```

```
/////Read Tank Motor Switch  
/*  
if(buttonState == LOW)  
{  
  if(Firebase.RTDB.getInt(&fbdo, "Data/Motor", &Motor))  
  {  
    Serial.println("Motor");  
    Serial.println(Motor);  
    Serial.println(count++);  
  
  }  
  
  if(Motor==1)  
  {  
    digitalWrite(Agri_Motor,HIGH);  
  }  
  
  if(Motor==0)  
  {  
    digitalWrite(Agri_Motor,LOW);  
  }  
}*/  
}  
}  
}
```