Smart Water System

IoT Based Water Level Indicator using Ultrasonic Sensor

Source Codes for Blynk ESP32 Water Level Sensor:

```
* TITLE: IoT-based Water Level Indicator using ESP32, Ultrasonic Sensor & Blynk
with 0.96" OLED
* Click on the following links to learn more.
* YouTube Video: https://youtu.be/9geREeE13jc
* Related Blog : https://iotcircuithub.com/esp32-projects/
* This code is provided free for project purpose and fair use only.
* Please do mail us to techstudycell@gmail.com if you want to use it
commercially.
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* Preferences--> Aditional boards Manager URLs :
* https://raw.githubusercontent.com/espressif/arduino-esp32/gh-
pages/package_esp32_dev_index.json,
http://arduino.esp8266.com/stable/package_esp8266com_index.json
* Download Board ESP32 (2.0.5) : https://github.com/espressif/arduino-esp32
* Download the libraries
* Blynk Library (1.1.0): https://github.com/blynkkk/blynk-library
* Adafruit SSD1306 Library (2.5.7):
https://github.com/adafruit/Adafruit SSD1306
* AceButton Library (1.9.2): https://github.com/bxparks/AceButton
*******************************
/* Fill-in your Template ID (only if using Blynk.Cloud) */
#define BLYNK TEMPLATE ID ""
#define BLYNK DEVICE NAME ""
#define BLYNK_AUTH_TOKEN ""
// Your WiFi credentials.
```

```
// Set password to "" for open networks.
char ssid[] = "";
char pass[] = "";
//Set Water Level Distance in CM
int emptyTankDistance = 70; //Distance when tank is empty
int fullTankDistance = 30; //Distance when tank is full
//Set trigger value in percentage
int triggerPer = 10 ; //alarm will start when water level drop below
triggerPer
#include <Adafruit SSD1306.h>
#include <WiFi.h>
#include <WiFiClient.h>
#include <BlynkSimpleEsp32.h>
#include <AceButton.h>
using namespace ace_button;
// Define connections to sensor
#define TRIGPIN 27 //D27
#define ECHOPIN 26 //D26
#define wifiLed 2 //D2
#define ButtonPin1 12 //D12
#define BuzzerPin 13 //D13
#define GreenLed 14 //D14
//Change the virtual pins according the rooms
#define VPIN BUTTON 1 V1
#define VPIN BUTTON 2
                       V2
#define SCREEN WIDTH 128 // OLED display width, in pixels
#define SCREEN HEIGHT 32 // OLED display height, in pixels
// Declaration for an SSD1306 display connected to I2C (SDA, SCL pins)
#define OLED RESET -1 // Reset pin # (or -1 if sharing Arduino reset pin)
Adafruit SSD1306 display(SCREEN WIDTH, SCREEN HEIGHT, &Wire, OLED RESET);
float duration;
float distance;
int waterLevelPer;
bool toggleBuzzer = HIGH; //Define to remember the toggle state
char auth[] = BLYNK AUTH TOKEN;
```

```
ButtonConfig config1;
AceButton button1(&config1);
void handleEvent1(AceButton*, uint8_t, uint8_t);
BlynkTimer timer;
void checkBlynkStatus() { // called every 3 seconds by SimpleTimer
 bool isconnected = Blynk.connected();
  if (isconnected == false) {
   //Serial.println("Blynk Not Connected");
   digitalWrite(wifiLed, LOW);
  }
 if (isconnected == true) {
   digitalWrite(wifiLed, HIGH);
   //Serial.println("Blynk Connected");
 }
}
BLYNK_CONNECTED() {
 Blynk.syncVirtual(VPIN_BUTTON_1);
 Blynk.syncVirtual(VPIN_BUTTON_2);
}
void displayData(int value){
  display.clearDisplay();
 display.setTextSize(4);
 display.setCursor(8,2);
 display.print(value);
 display.print(" ");
 display.print("%");
 display.display();
}
void measureDistance(){
 // Set the trigger pin LOW for 2uS
 digitalWrite(TRIGPIN, LOW);
  delayMicroseconds(2);
 // Set the trigger pin HIGH for 20us to send pulse
  digitalWrite(TRIGPIN, HIGH);
  delayMicroseconds(20);
```

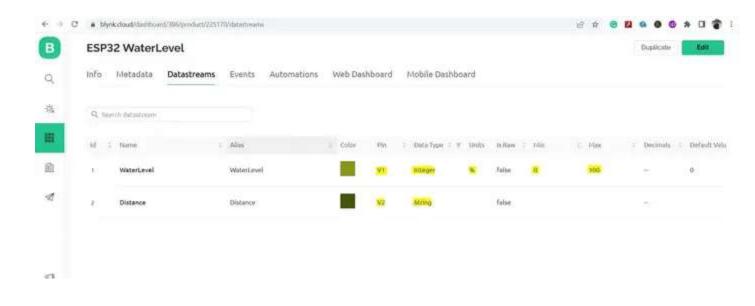
```
// Return the trigger pin to LOW
  digitalWrite(TRIGPIN, LOW);
  // Measure the width of the incoming pulse
  duration = pulseIn(ECHOPIN, HIGH);
 // Determine distance from duration
  // Use 343 metres per second as speed of sound
  // Divide by 1000 as we want millimeters
  distance = ((duration / 2) * 0.343)/10;
  if (distance > (fullTankDistance - 10) && distance < emptyTankDistance ){</pre>
    waterLevelPer = map((int)distance ,emptyTankDistance, fullTankDistance, 0,
100);
    displayData(waterLevelPer);
    Blynk.virtualWrite(VPIN BUTTON 1, waterLevelPer);
    Blynk.virtualWrite(VPIN_BUTTON_2, (String(distance) + " cm"));
    // Print result to serial monitor
    Serial.print("Distance: ");
    Serial.print(distance);
    Serial.println(" cm");
    if (waterLevelPer < triggerPer){</pre>
      digitalWrite(GreenLed, HIGH);
      if (toggleBuzzer == HIGH){
        digitalWrite(BuzzerPin, HIGH);
      }
    }
    if (distance < fullTankDistance){</pre>
      digitalWrite(GreenLed, LOW);
      if (toggleBuzzer == HIGH){
        digitalWrite(BuzzerPin, HIGH);
      }
    }
    if (distance > (fullTankDistance + 5) && waterLevelPer > (triggerPer + 5)){
      toggleBuzzer = HIGH;
      digitalWrite(BuzzerPin, LOW);
    }
  }
  // Delay before repeating measurement
  delay(100);
```

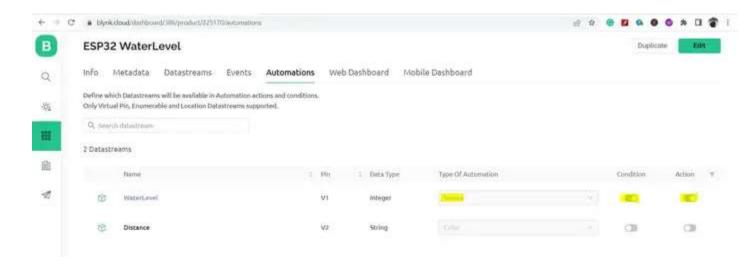
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```
}
void setup() {
 // Set up serial monitor
 Serial.begin(115200);
 // Set pinmodes for sensor connections
  pinMode(ECHOPIN, INPUT);
  pinMode(TRIGPIN, OUTPUT);
  pinMode(wifiLed, OUTPUT);
  pinMode(GreenLed, OUTPUT);
  pinMode(BuzzerPin, OUTPUT);
  pinMode(ButtonPin1, INPUT_PULLUP);
  digitalWrite(wifiLed, LOW);
  digitalWrite(GreenLed, LOW);
  digitalWrite(BuzzerPin, LOW);
 config1.setEventHandler(button1Handler);
 button1.init(ButtonPin1);
 if(!display.begin(SSD1306_SWITCHCAPVCC, 0x3C)) {
   Serial.println(F("SSD1306 allocation failed"));
   for(;;);
  }
  delay(1000);
  display.setTextSize(1);
 display.setTextColor(WHITE);
 display.clearDisplay();
 WiFi.begin(ssid, pass);
 timer.setInterval(2000L, checkBlynkStatus); // check if Blynk server is
connected every 2 seconds
  Blynk.config(auth);
 delay(1000);
}
void loop() {
 measureDistance();
 Blynk.run();
```

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