Lab Ultrasonic Module Distance Measuring Transducer Sensor

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โจทย์ : เมื่อวัตถุเข้ามาใกล้มากกว่า 30 เซนติเมตรให้ไฟติด

อธิบายหลักการทำงาน

NodeMCU ตัวที่ 1 ใช้เป็นตัวส่งระยะทาง ไปที่ Cloud mqtt

NodeMCU ตัวที่ 2 ใช้เป็นตัวรับข้อมูลระยะทางจาก Cloud mqtt โดยถ้าระยะทางน้อยกว่า 30 ซม. ไฟจะติด

Source code ตัวส่ง

#include <ESP8266WiFi.h>

#include <PubSubClient.h>

const int pingPin = D8; //trig

int inPin = D5; //echo

const char\* ssid = "Apple TV";

const char\* password = "APPLE\_TV";

const char\* mqtt\_server = "m12.cloudmqtt.com";

char msg[50];

WiFiClient espClient;

PubSubClient client(espClient);

void setup() {

Serial.begin(115200);

setup\_wifi();

client.setServer(mqtt\_server, 10250); //port ใน mqtt

client.setCallback(callback);

}

void setup\_wifi() {

delay(10);

// We start by connecting to a WiFi network

Serial.println();

Serial.print("Connecting to ");

Serial.println(ssid);

WiFi.begin(ssid, password);

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

delay(500);

Serial.print(".");

}

Serial.println("");

Serial.println("WiFi connected");

Serial.println("IP address: ");

Serial.println(WiFi.localIP());

}

void callback(char\* topic, byte\* payload, unsigned int length) {

Serial.print("Message arrived [");

Serial.print(topic);

Serial.print("] ");

}

void reconnect() {

// Loop until we're reconnected

while (!client.connected()) {

Serial.print("Attempting MQTT connection...");

// Attempt to connect

if (client.connect("Ultra", "wvottqye", "tr8fy-KkiXay")) { // topic,username,password

Serial.println("connected");

// Once connected, publish an announcement...

client.publish("iot", "Start");

// ... and resubscribe

//client.subscribe("Node2");

client.publish("/checkDistance", "Hi");

} else {

Serial.print("failed, rc=");

Serial.print(client.state());

Serial.println(" try again in 5 seconds");

// Wait 5 seconds before retrying

delay(5000);

}

}

}

void loop() {

if (!client.connected()) {

reconnect();

}

client.loop();

char so[50];

long duration, cm;

pinMode(pingPin, OUTPUT);

digitalWrite(pingPin, LOW);

delayMicroseconds(2);

digitalWrite(pingPin, HIGH);

delayMicroseconds(5);

digitalWrite(pingPin, LOW);

pinMode(inPin, INPUT);

duration = pulseIn(inPin, HIGH);

cm = microsecondsToCentimeters(duration);

Serial.print(cm);

Serial.print("cm");

Serial.println();

delay(100);

itoa(cm, so, 10);

snprintf (msg, 75, so);

client.publish("/checkDistance", msg);

Serial.print("MSG: ");

Serial.println(msg);

delay(1000);

}

long microsecondsToCentimeters(long microseconds)

{

// The speed of sound is 340 m/s or 29 microseconds per centimeter.

// The ping travels out and back, so to find the distance of the

// object we take half of the distance travelled.

return microseconds / 29 / 2;

}

Source code ตัวรับ

#include <ESP8266WiFi.h>

#include <PubSubClient.h>

const char\* ssid = "Apple TV";

const char\* password = "APPLE\_TV";

#define mqtt\_server "m12.cloudmqtt.com"

#define mqtt\_port 10250

#define mqtt\_user "wvottqye"

#define mqtt\_password "tr8fy-KkiXay"

float oldTemp = 0.0;

WiFiClient espClient;

PubSubClient client(espClient);

void setup() {

pinMode(D1, OUTPUT);

Serial.begin(115200);

digitalWrite(D1, HIGH);

delay(10);

Serial.println();

Serial.print("Connecting to ");

Serial.println(ssid);

WiFi.begin(ssid, password);

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

delay(500);

Serial.print(".");

}

Serial.println("");

Serial.println("WiFi connected");

Serial.println("IP address: ");

Serial.println(WiFi.localIP());

client.setServer(mqtt\_server, mqtt\_port);

client.setCallback(callback);

}

void loop() {

if (!client.connected()) {

Serial.print("Attempting MQTT connection...");

if (client.connect("iotsub", mqtt\_user, mqtt\_password)) {

Serial.println("connected");

client.subscribe("/checkDistance");

} else {

Serial.print("failed, rc=");

Serial.print(client.state());

Serial.println(" try again in 5 seconds");

delay(5000);

return;

}

}

client.loop();

}

void callback(char\* topic, byte\* payload, unsigned int length) {

//Serial.print("Message arrived [");

//Serial.print(topic);

String msg = "";

String to = "";

int i = 0;

while (i < length) msg += (char)payload[i++];

// Serial.println(msg);

to = topic;

// Serial.print(to);

if (to == "/checkDistance") {

Serial.println(msg);

if (msg.toFloat() > 30) {

digitalWrite(D1, LOW);

} else {

digitalWrite(D1, HIGH);

}

}

}