



Getting Started with ESP-NOW

Will guide you to communicate between ESP32 controllers by using ESP NOW protocol.

 Difficulté Facile

 Durée 1 heure(s)

 Catégories Électronique

 Coût 10 USD (\$)

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Introduction

ESP-NOW is a wireless communication protocol based on the data-link layer that enables the direct, quick, and low-power control of smart devices without the need for a router. Espressif defines it and can work with Wi-Fi and Bluetooth LE. ESP-NOW provides flexible and low-power data transmission to all interconnected devices. It can also be used as an independent protocol that helps with device provisioning, debugging, and firmware upgrades.

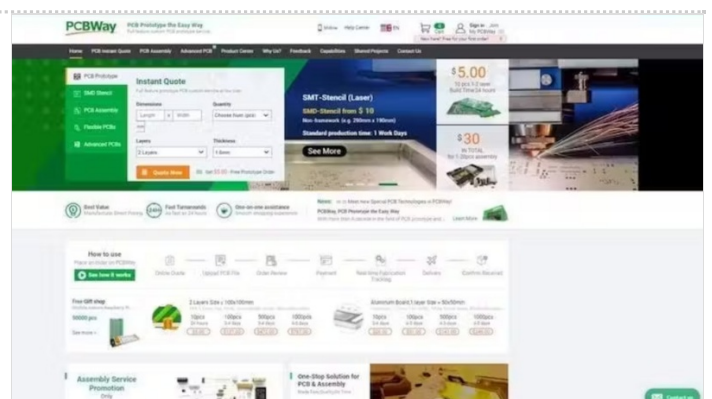
ESP-NOW is a connectionless communication protocol developed by Espressif that features short packet transmission. This protocol enables multiple devices to talk to each other in an easy way. It is a fast communication protocol that can be used to exchange small messages (up to 250 bytes) between ESP32 or ESP8266 boards. ESP-NOW supports the following features: Encrypted and unencrypted unicast communication; Mixed encrypted and unencrypted peer devices; Up to 250-byte payload can be carried; Sending callback function that can be set to inform the application layer of transmission success or failure.

Matériaux

Étape 1 - Get PCBs for Your Projects Manufactured

You must check out PCBWAY for ordering PCBs online for cheap! You get 10 good-quality PCBs manufactured and shipped to your doorstep for cheap. You will also get a discount on shipping on your first order. Upload your Gerber files onto PCBWAY to get them manufactured with good quality and quick turnaround time. PCBWay now could provide a complete product solution, from design to enclosure production. Check out their online Gerber viewer function. With reward points, you can get free stuff from their gift shop.

Outils



Étape 2 - How is it different from existing protocols?

ESP-NOW is a wireless communication protocol that is different from Wi-Fi and Bluetooth in that it reduces the five layers of the OSI model to only one¹. Additionally, ESP-NOW occupies fewer CPU and flash resources than traditional connection protocols while co-exists with Wi-Fi and Bluetooth LE.

Bluetooth is used to connect short-range devices for sharing information, while Wi-Fi is used for providing high-speed internet access². Wi-Fi provides high bandwidth because the speed of the internet is an important issue.

Max Distance:

The range of ESP-NOW is up to 480 meters when using the ESP-NOW protocol for bridging between multiple ESP32s¹. The range can be further increased by enabling long-range ESP-NOW. When enabled, the PHY rate of ESP32 will be 512Kbps or 256Kbps.

Maximum nodes:

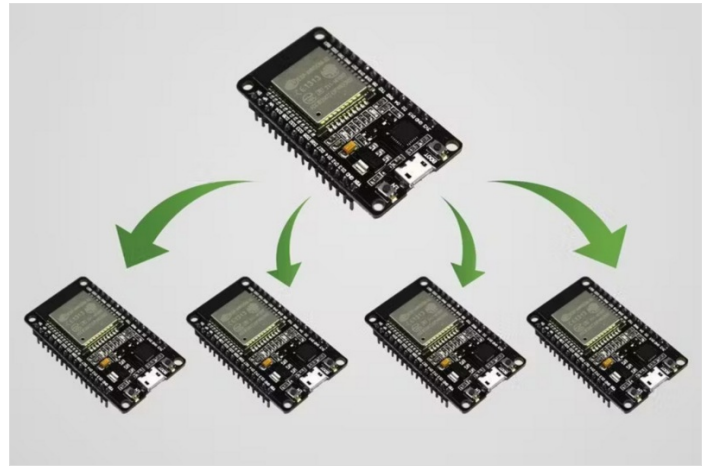
ESP-NOW supports various series of Espressif chips, providing a flexible data transmission that is suitable for connecting “one-to-many” and “many-to-many” devices.

Applications:

ESP-NOW is widely used in

- smart-home appliances,
- remote controlling,
- sensors, etc.

In this tutorial, will see how to implement a basic ESP NOW communication between ESP32 Microcontrollers.



Étape 3 - Setting Up the Receiver

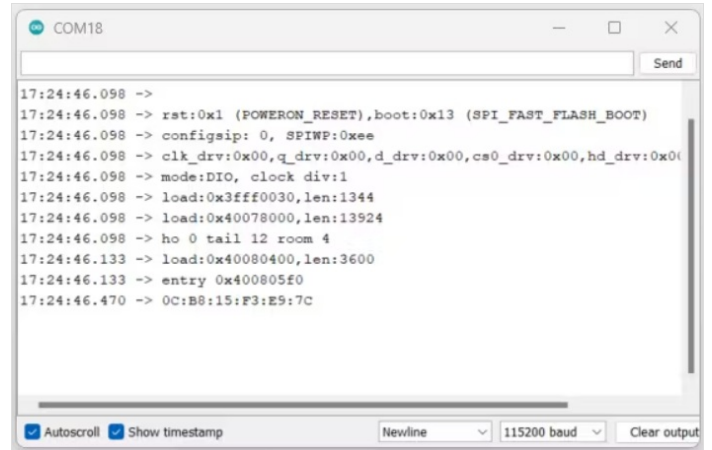
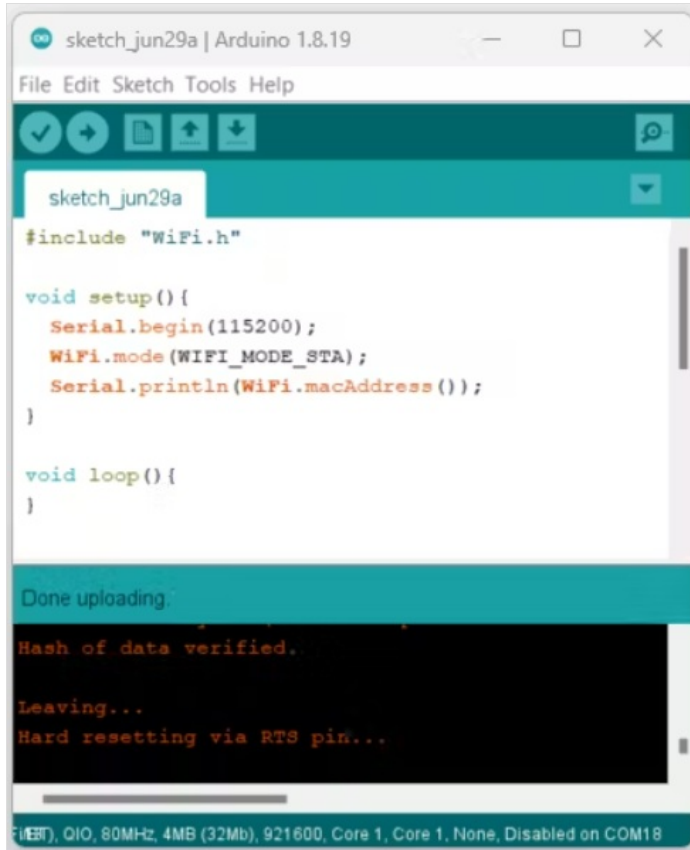
ESPNOW communication works based on the MAC address of the nodes. So, we need to find the Mac address of our slave or receiver node.]For that just upload the following sketch to the ESP32 board and look for the Mac address in the serial monitor.

```
#include "WiFi.h"

void setup(){
  Serial.begin(115200);
  WiFi.mode(WIFI_MODE_STA);
  Serial.println(WiFi.macAddress());
}

void loop(){
}
```

Once you uploaded the code, press the EN button and wait for the serial monitor results. It will show you the Mac address. Note that.




```

#include <esp_now.h>
#include <WiFi.h>

// Structure example to receive data
typedef struct struct_message {
    char a[32];
    int b;
    float c;
    bool d;
} struct_message;

// Create a struct_message called myData
struct_message myData;

// callback function that will be executed when data is received
void OnDataRecv(const uint8_t * mac, const uint8_t *incomingData, int len) {
    memcpy(&myData, incomingData, sizeof(myData));
    Serial.print("Bytes received: ");
    Serial.println(len);
    Serial.print("Char: ");
    Serial.println(myData.a);
    Serial.print("Int: ");
    Serial.println(myData.b);
    Serial.print("Float: ");
    Serial.println(myData.c);
    Serial.print("Bool: ");
    Serial.println(myData.d);
    Serial.println();
}

void setup() {
    // Initialize Serial Monitor
    Serial.begin(115200);

    // Set device as a Wi-Fi Station
    WiFi.mode(WIFI_STA);

    // Init ESP-NOW
    if (esp_now_init() != ESP_OK) {
        Serial.println("Error initializing ESP-NOW");
        return;
    }

    // get recv packer info
    esp_now_register_recv_cb(OnDataRecv);
}

void loop() {
}

```

Serial monitor results.

Étape 6 - Wrap Up:

We have seen how to implement the ESP NOW in ESP32 microcontroller, in upcoming tutorials will see how to transmit sensor data via ESPNOW.
