**Final Wiring: ESP32 + Relay Module + NMES Device**

This setup will allow the ESP32 to control an **NMES (Neuromuscular Electrical Stimulation) device** using a **relay module**. The relay acts as a switch that turns the NMES device ON and OFF based on signals from the ESP32.

**Components Used**

1. **ESP32** (to control the relay)
2. **Relay Module** (to switch the NMES device ON/OFF)
3. **NMES Device** (the device being controlled)
4. **Power Source for NMES Device** (Battery pack or wall adapter)
5. **Jumper Wires & Breadboard** (for easy connections)

**Wiring Breakdown**

**1️. ESP32 to Relay Module**

* **VCC (Relay) → 5V (ESP32)**
* **GND (Relay) → GND (ESP32)**
* **IN (Relay) → GPIO 16** *(used to control the relay switch)*

**2️. Relay Module to NMES Device**

* **COM (Relay) → Positive (+) wire from NMES power source** *(common connection for switching)*
* **NO (Normally Open) → Positive (+) input of NMES device** *(power flows when relay is activated)*
* **GND (NMES Power Source) → GND (NMES Device)** *(remains directly connected)*

**How It Works**

* **ESP32 sends LOW (0V) to the relay** → **Relay is OFF**, the NMES device gets **no power**.
* **ESP32 sends HIGH (3.3V or 5V) to the relay** → **Relay turns ON**, completing the circuit and **powering the NMES device**.
* When the ESP32 toggles the relay ON/OFF, it controls whether the NMES device receives power.

**Why Use a Relay Instead of a MOSFET?**

* **Completely isolates the ESP32 from the NMES power source**
* **Works with both DC and AC-powered NMES devices**
* **Can handle high-power loads safely**

Diagram:

A computer screen shot of a circuit board

AI-generated content may be incorrect.