Button and Buzzer

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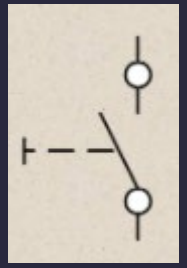
/Button or Push Button Switch

Button or Push Button Switch

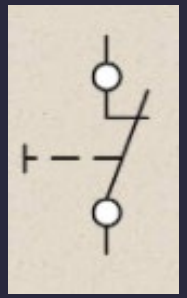
A switch is an electrical device commonly used for basic electrical control purposes. Its role is to interrupt or establish an electrical circuit to either allow or stop the flow of electrical current. Switches are used to control various electrical devices such as electric motors and machinery. There are many types of switches, including slide switches, push-button switches, rocker switches, toggle switches, rotary switches, and microswitches, among others.

Button or Push Button Switch

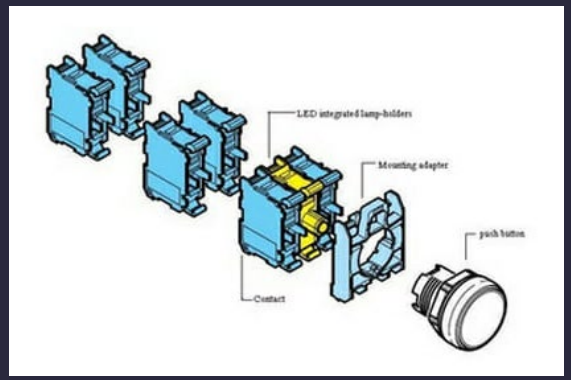
A momentary push-button switch used for initiating a process (Start) is referred to as a Normally Open switch, often abbreviated as N.O.



A momentary push-button switch used to halt a process (Stop) is known as a Normally Closed switch, often abbreviated as N.C.



The structure of a push-button switch



The structure of a push-button switch can be divided into four parts:

1. The button, which can be made of plastic or metal and is available in various colors.
2. The base, which secures the button and the front contact plate. It usually has screws for attaching the switch to devices or objects.
3. The front contact plate, which contains the NO (Normally Open) and NC (Normally Closed) contacts.
4. An LED indicator light used to display the switch's status.

Types of Push Button Switches

Push Button Switch - Momentary Toggle

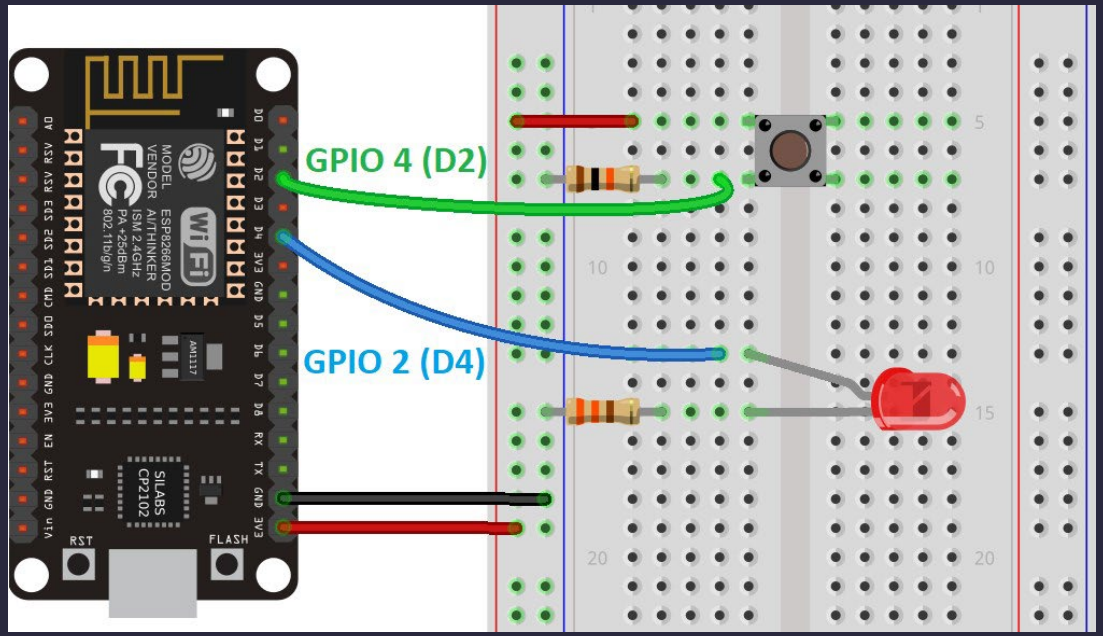
A momentary toggle push button switch is a type of switch that, when pressed, momentarily toggles between the Normally Open (NO) and Normally Closed (NC) states. In this configuration, pressing the button changes the state from NO to NC or from NC to NO. However, when you release the button, it returns to its original state (NO or NC), driven by the force exerted by a spring mechanism. These momentary toggle switches are commonly used in applications where you need momentary control of a circuit, and the toggle function allows for quick engagement and disengagement.

Types of Push Button Switches

Push Button Switch - Push On/Push Off

A push button switch, also known as a push on/push off switch, operates in a manner where it toggles between two states when pressed and remains in the last state until pressed again. This type of switch is used for applications where a simple push is used to turn a circuit or device on, and another push is used to turn it off. The switch has a stable state, and pressing it once changes its state, while another press returns it to the previous state. These switches are commonly found in various consumer electronics and control systems where you need to easily switch between an on and off state.

Wiring

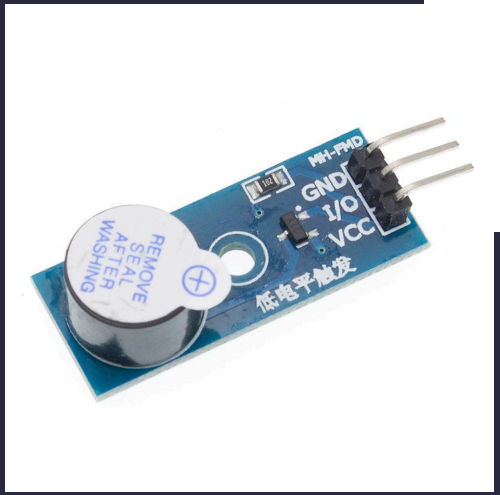

GPIO 4 (D2)
GPIO 2 (D4)
MODEL ESP8266MOD
VENDOR AITHINKER
ISM 2.4GHz
PA +25dBm
802.11b/g/n
SILABS CP2102
RST
FLASH

Coding

```
1  const int buttonPin = 4;
2  const int ledPin = 2;
3  int buttonState = 0;
4  void setup()
5  {
6  pinMode(ledPin, OUTPUT);
7  pinMode(buttonPin, INPUT);
8  }
9  void loop()
10 {
11 buttonState = digitalRead(buttonPin);
12   if (buttonState == HIGH)
13   {
14   digitalWrite(ledPin, LOW);
15   }
16   else
17   {
18   digitalWrite(ledPin, HIGH);
19   }
20 }
21
```

/02

/Buzzer


MH-FMD
GND
I/O
VCC
低电平触发
REMOVE SEAL AFTER WASHING


REMOVE SEAL AFTER WASHING

Operating Principle of a Buzzer Circuit

Buzzers are sound devices that can convert electrical signals into audible sound. Buzzers are like simple circuits driven by direct current (DC). Additionally, you can use them for various applications, such as alarm systems, computer printers, and other electronic products that produce buzzing sounds.

Furthermore, there are two main types, including electromagnetic buzzers and piezoelectric buzzers. So, to explain the operating principle of a buzzer circuit, we will discuss both types separately.

Operating Principle of a Buzzer Circuit

1.1 Operating Principle of Piezoelectric Buzzer Circuit

A Piezo Buzzer uses ceramics with Piezoelectric effects to generate pulses. These pulses create a current that utilizes the vibration of a metal diaphragm to produce a buzzing sound.

The primary components of this buzzer include a sound-reflecting housing, a Piezoelectric diaphragm, a housing cap, and a matching resistor. Additionally, you may find Piezoelectric buzzers with diodes that emit light.

Moreover, a specific multiresonator component works in tandem with transistors or integrated circuits (ICs) in some designs. So, when you energize the power source of this circuit, often in the range of 1.5 to 2.5 volts DC, oscillation occurs. As a result, the multiresonator generates a sound signal at 1.5 to 2.5 kHz.

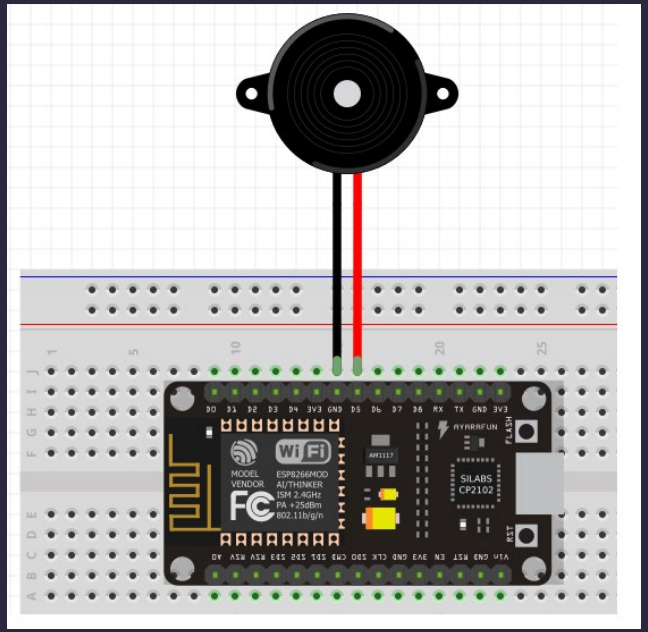
Operating Principle of a Buzzer Circuit

1.2 Operating Principle of Electromagnetic Buzzer Circuit

Conversely, the Electromagnetic Buzzer contains an oscillator, a vibrating diaphragm, electromagnetic coil, housing, and an iron core as its essential components. When you power up the circuit of this electromagnetic buzzer, the oscillator generates a sound signal and sends it through the electromagnetic coil to create a magnetic field.

What's interesting here is that when the vibrating diaphragm is introduced into this part, it vibrates periodically and produces sound that depends on the actions of the iron core and the solenoid coil. As a result, Electromagnetic Buzzers generate output at 2 - 4 kHz.

Wiring



Buzzer	ESP8266
+	D5
-	GND

Coding

```
1  int buzzer_Pin = 14;//D5
2
3  void setup() {
4
5  pinMode(buzzer_Pin , OUTPUT);
6
7  }
8
9  void loop() {
10
11   digitalWrite(buzzer_Pin, HIGH);
12   delay(1000);
13   digitalWrite(buzzer_Pin, LOW);
14   delay(1000);
15
16 }
17
```

LAB:

Q/A