

Project 15 - Button Control Fan

1. project description

In this project , you will learn how to control a small DC motor to start and stop with the push of a button . The program function of this project is that when the button is pressed once, the relay closes and the fan starts, and when the button is pressed again, the relay opens and the fan stops.

2. Introduction to modules

2.1 Relay



Relays generally refer to electromagnetic relays, which are mechanical action switches .

The essence of a relay is to use one circuit (usually a small current) to control the on-off of another circuit (usually a large current), and during this control process, the two circuits are generally isolated . Its basic principle is to use electromagnetic effects to control mechanical contacts to achieve the purpose of switching on and off.

process:

The iron core coil is energized - the coil current generates a magnetic field - the magnetic field absorbs the armature and acts on the contacts to make and break the contacts. It is a process of "small current - magnetism - machinery - large current".

Approximate pin diagram

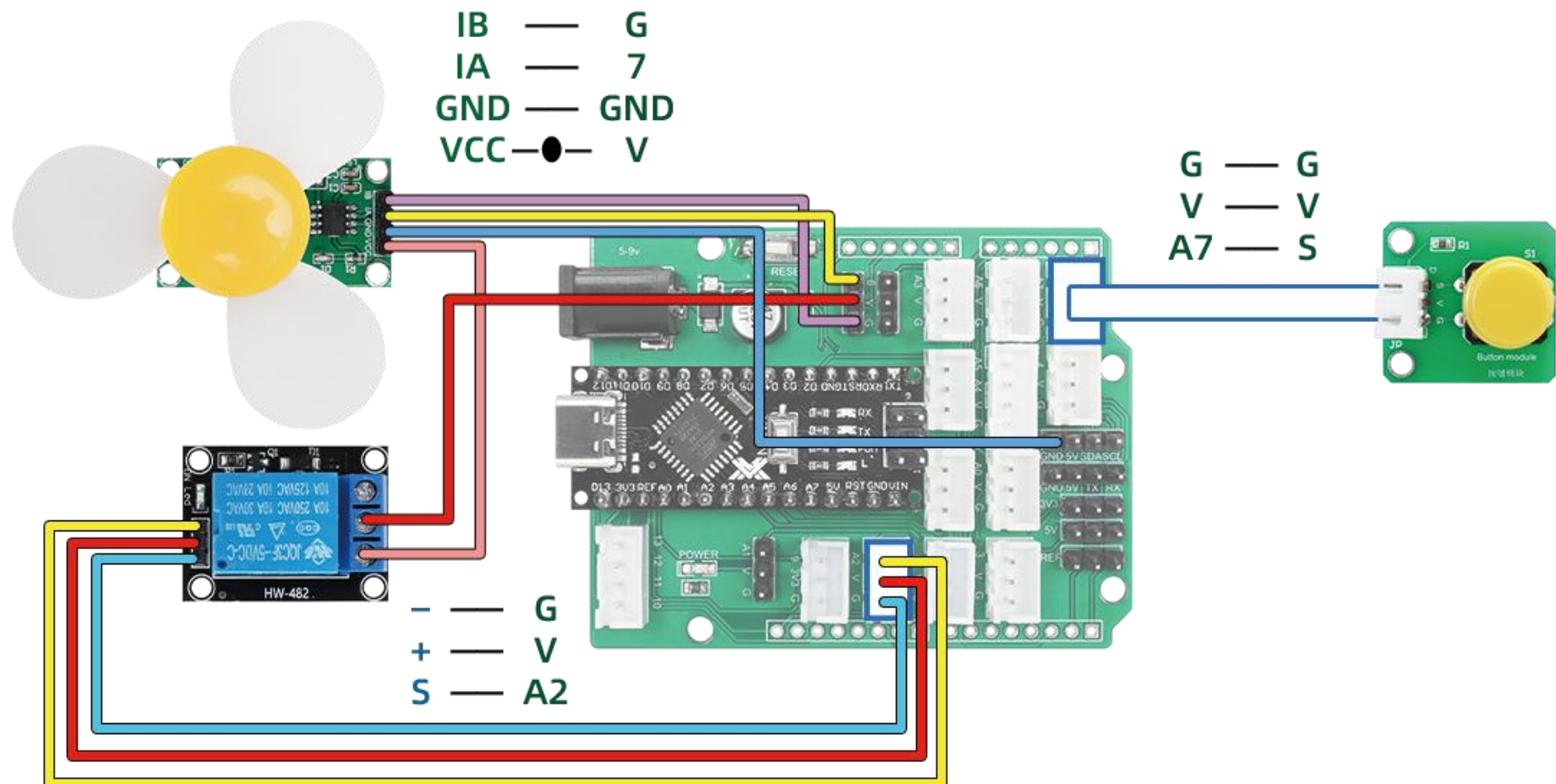


VCC is the positive pole of the power supply, GND is the negative pole of the power supply, and IN is the switch signal input pin.

NC is a normally closed end, COM is a common end, and NO is a normally open end.




Open circuit means that the switch is disconnected , and closed means that the switch is closed. That is to say, in the absence of any power-on or other actions, the NC and COM terminals are equivalent to being connected. Since the relay module integrates a transistor, the signal pin only needs to be fed into a high level, the normally open relay is closed, and the low level relay is open. Default is low.

3. Project wiring diagram



4. Download Arduino code

Open the project Arduino code file (path: project 15 button control fan\project15\project15.ino)

 project15	2023/10/16 13:57	文件夹	
 Button controls the fan.mp	2023/10/6 13:46	MP 文件	166 KB
 项目 15 按钮控制风扇.docx	2023/10/7 17:24	DOCX 文档	552 KB

Connect the main control board to the computer using USB, select the board type as Nano, select the newly displayed COM number, click "Download" to start compiling and downloading the program to the main control board.

Code analysis:

```

1  #define RelayPin  A2      //定义继电器引脚A2  Relay A2
2  #define FanPinA   7       //定义风扇引脚1A  L9110 1A
3  #define KEY       A7      //定义按钮引脚A7  Define input pin
4
5  int buttonState=1;        //定义按钮状态  Define key status bits
6  int lastButtonState=1;    //上一次按键状态  Last key press status
7  bool Relay_BIT=false;     //继电器状态
8
9  void setup() //初始化设置  Function initialization
10 {
11     Serial.begin(9600);
12     pinMode(RelayPin, OUTPUT); //设置继电器引脚为输出  Set the relay pin as the output
13     pinMode(FanPinA, OUTPUT);  //设置风扇引脚为输出  Set the fan pin as the output
14     pinMode(KEY, INPUT);       //设置按钮引脚为输入  Set the button pin as input
15     analogWrite(FanPinA,HIGH); //风扇信号引脚设置高电平  Set the fan pin as the high level

```

```
18 void loop() //主函数    Principal function
19 {
20     buttonState = analogRead(KEY);    //获取按钮状态    Getting the button status
21     if(buttonState != lastButtonState)    //按钮消抖    Button chattering
22     {
23         delay(20);
24         buttonState = analogRead(KEY);
25         if(buttonState != lastButtonState)
26         {
27             if(buttonState == LOW)
28             {
29                 Relay_BIT = !Relay_BIT;
30             }
31         }
32     }
33     lastButtonState = buttonState;
34     if (Relay_BIT){    //判断Relay_BIT是否为“真”    Determine whether Relay_BIT is true
35         digitalWrite(RelayPin, HIGH);    //开启风扇    Turn on the fan
36     }else digitalWrite(RelayPin, LOW);    //关闭风扇    Turn off the fan
37 }
```

5. Download Mind+ graphical code

Open the project Mind+code file (path: Project 15 Button controls the fan\Button controls the fan.mp)

project15	2023/10/16 13:57	文件夹	
Button controls the fan.mp	2023/10/6 13:46	MP 文件	166 KB
项目 15 按钮控制风扇.docx	2023/10/7 17:24	DOCX 文档	552 KB

Connect the main control board to the computer with a USB cable and select the newly appeared CH340 serial port COM number. Click "Upload to Device" to complete the code upload.

Programming analysis:



