

Project 14-Speed Fan

1. project description

In this project , you will learn how to use Nano to control the speed of a small DC motor .

2. Introduction to modules

2.1 140 motor driver



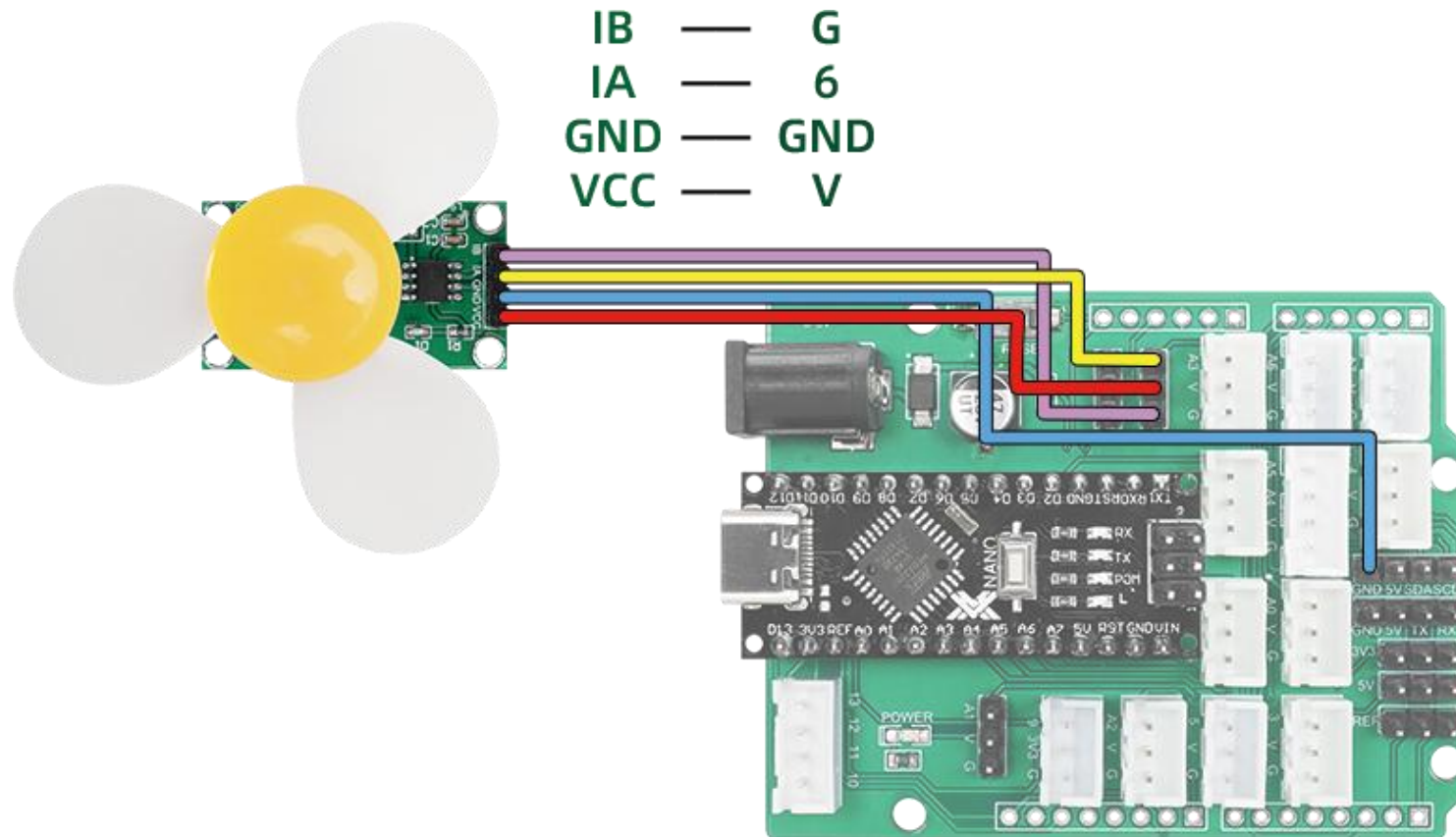
A DC motor is a rotating electrical machine that converts DC electrical energy into mechanical energy (DC motor) or mechanical energy into DC electrical energy (DC generator).

It is an electric motor that can convert DC electrical energy into mechanical energy. It is also a current driving component

that requires large current to pass through. The output current of the IO output port of a traditional single-chip microcomputer is generally around 10mA, and the current of a single-chip microcomputer is generally 20-25mA. However, the total current of multiple IO ports is limited, and some cannot exceed 200mA. The driving capability of the microcontroller IO port is far from enough. Therefore, a driving device is needed to control the motor. Here we choose the L9110 motor driver chip, which has enough current to drive the motor.




Since motor drivers require signals to drive the motor, the L9110 is a single-channel driver with two signal input pins. 1A and 1B are signal input pins, which provide high-level and low-level signals respectively to make the motor run. When high-level or low-level signals are given at the same time, the motor stops running. It is also possible to use only one signal input and VCC for control.

3. Project wiring diagram



4. Download Arduino code

Open the project Arduino code file (path: Project 14 Speed Control Fan\project14\project14.ino)

 project14	2023/10/7 14:04	文件夹	
 SpeedFan.mp	2023/9/27 11:20	MP 文件	166 KB
 项目 14 调速风扇.docx	2023/10/7 16:29	DOCX 文档	537 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:

```
5  #define FanPin 6           //定义风扇电机信号引脚6   Define fan motor signal pin 6
6
7  void setup()
8  {
9      Serial.begin(9600);
10     pinMode(FanPin, OUTPUT); //设置电机信号引脚6为输出   Configure the pin mode
11 }
```

```
13 void loop()  
14 {  
15     for (int i = 30; i <= 255; i++)//速度从30增加到255    Speed increased from 30 to 255  
16     {  
17         Serial.print("speed = ");  
18         Serial.println(i);  
19         analogWrite(FanPin,i);  
20         delay(50);  
21     }  
22     for (int i = 255; i >= 30; i--)//速度从255降低到30    Speed reduced from 255 to 30  
23     {  
24         Serial.print("speed = ");  
25         Serial.println(i);  
26         analogWrite(FanPin,i);  
27         delay(50);  
28     }  
29 }
```

See the value printed on the serial monitor

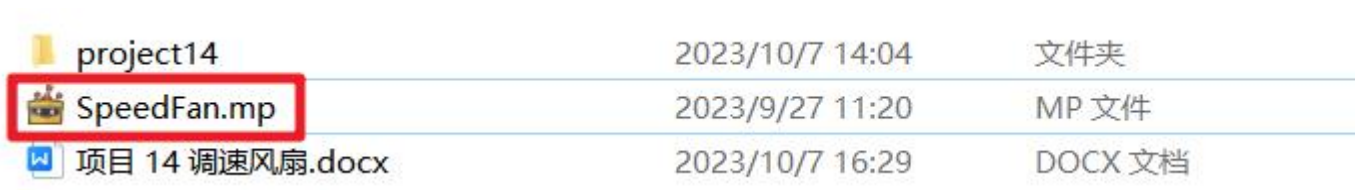
Output Serial Monitor ✕

Message (Enter to send message to 'Arduino Nano' on 'COM5')

```
speed = 181  
speed = 182  
speed = 183  
speed = 184  
speed = 185  
speed = 186  
speed = 187
```

5. Download Mind+ graphical code

Open the project Mind+code file (path: Project 14 Speed Fan\SpeedFan.mp)



project14	2023/10/7 14:04	文件夹
SpeedFan.mp	2023/9/27 11:20	MP 文件
项目 14 调速风扇.docx	2023/10/7 16:29	DOCX 文档

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:

In programming, you need to use pins with pwm output function to adjust the speed. As shown in the figure below, the pins that support pwm output in the building block module have been listed. Here we use pin 6. (Speed adjustment is not required in later projects, other digital pins can be used)



The complete programming is as follows:

