Project - Motor Controller

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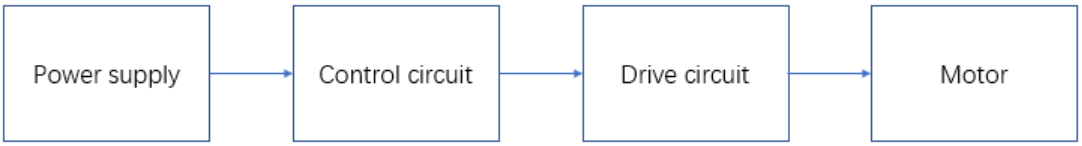
In this project, you need to design a motor controller to drive a DC motor or a stepper motor in the first place. Some extra fun work should be done with the motor controller afterwards.

Basic requirement



The circuit structure block diagram of motor controller is shown above. The control circuit is mainly used to generate PWM wave and send it into the latter part of the circuit. And the drive circuit include signal amplifier circuit and H-bridge drive circuit in most cases.

The basic requirement of the project is to drive a DC motor(e.g. BLDC) or a stepper motor(e.g. three-phase stepper motor). For DC motors, it should be controlled to speed up, slow down or brake by the keys. And for stepper motor, it should be controlled with keys to realize specific rotational number both clockwise and anticlockwise.

Then you have two options for your control and drive circuit here:

(1) If you are familiar with MCU, you can build the control circuit with it. The most commonly applied microcontroller belongs to 8051 family, which is also the recommended kind of microcontroller in this project since it is cheap and easy to use. Any other microcontroller that can realize the function is permitted.

(2) If you are not, you can build the PWM generation circuit with basic electrical elements. And you can decide how to arrange your device and design your own PCB for the motor and controller.

Finish the basic requirement above, you can get pass your project. If you want to get higher scores, you need to do some more interesting work. Some of the options are provided below.

Options

You can choose any one or some of them:

(1) The rotating speed can be shown with the Nixie tube or in a LCD;

(2) The DC motor could rotate clockwise or anticlockwise;

(3) You can assemble your motor and controller into a toy car. A chassis is necessary if you want to do this;

(4) Some other functions which could demonstrate your hard work.