Tutorial for VNH2SP30 Monster Motor Module (Single Channel)

by mybotic

Description

VNH2SP30 is a full bridge motor driver intended for a wide range of automotive applications. The device incorporates a dual monolithic high side driver and two low side switches. The high side driver switch is designed using the STMicroelectronic's well known and proven proprietary VIPower M0 technology which permits efficient integration on the same die of a true Power MOSFET with an intelligent signal/protection circuitary. The VIN and motor out are pitched for 5mm screw terminals, making it easy to connect larger gauge wires. INA and INB control the direction of each motor, and the PWM pins turns the motors on or off. For the VNH2SP30, the current sense (CS) pins will output approximately 0.13 volts per amp of output current.

Specification:

- Voltage Range : 5.5V - 16V
- Maximum Current rating : 30A
- Practical Continuous Current: 14 A
- Current sense output proportional to motor current
- MOSFET on-resistance: 19 m■ (per leg)
- Maximum PWM frequency: 20 kHz
- Thermal Shutdown
- Undervoltage and Overvoltage shutdown

Step 1: Material Preparation

For this tutorial, we required these items:

1. VNH2SP30 Monster Motor Module (Single Channel)

2. Arduino Uno Board and USB

3. Plastic Gear Motor

4. Li-Ion Rechargable Battery 7.4V 1200mAh

5. 2x Wire with Crocodile End Clip
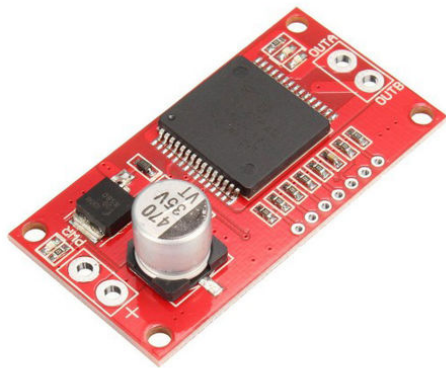
Step 2: Hardware Connection

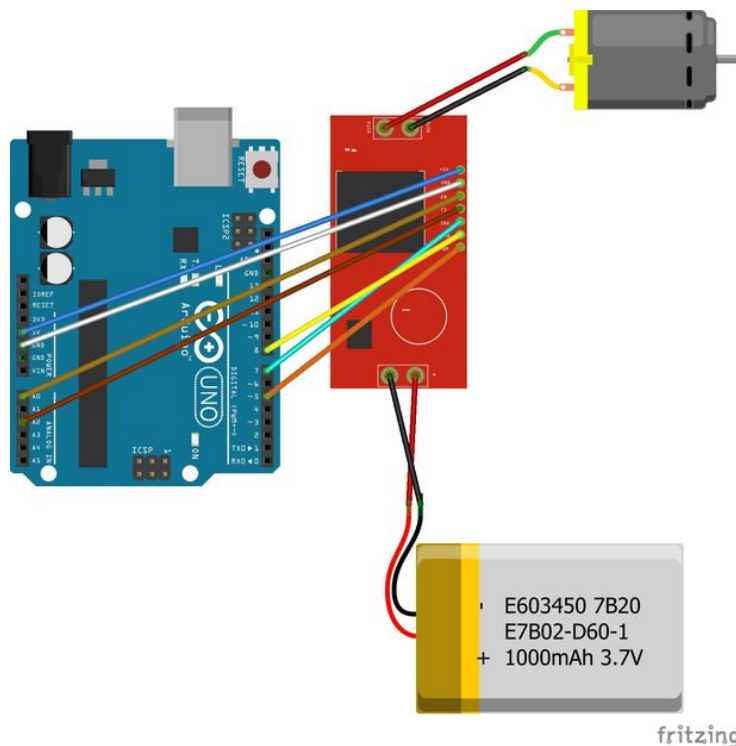Connect the VNH2SP30 Monster Motor Module (Single Channel) pin to Arduino Uno pin.
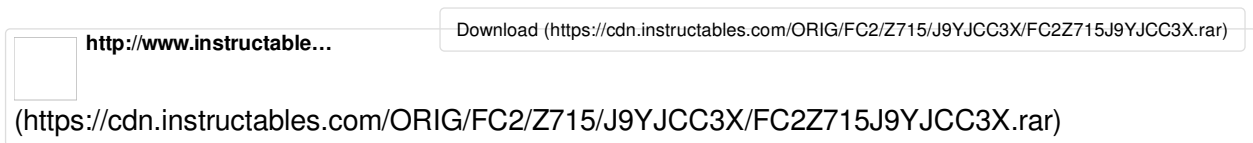
5V > 5V

GND > GND

CS > A2

INA > D7

INB > D8

PMW > D5

Step 3: Sample Source Code

This is a sample source code for the circuit, you may download, open and and upload it into your Arduino Uno Board. Make sure to go Tools and select the correct board and port.

http://www.instructable…

Download (https://cdn.instructables.com/ORIG/FC2/Z715/J9YJCC3X/FC2Z715J9YJCC3X.rar)

(https://cdn.instructables.com/ORIG/FC2/Z715/J9YJCC3X/FC2Z715J9YJCC3X.rar)

Step 4: Serial Monitor

After you have finished compiling the sample source code into your Arduino Uno board, go to Tools > Serial Monitor and you will get a serial monitor as shown in the picture above.
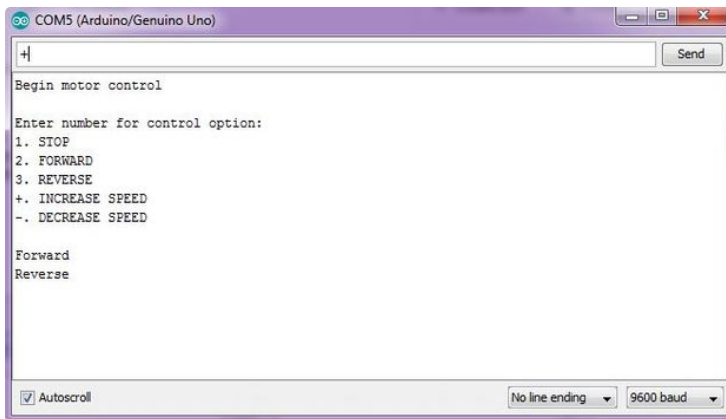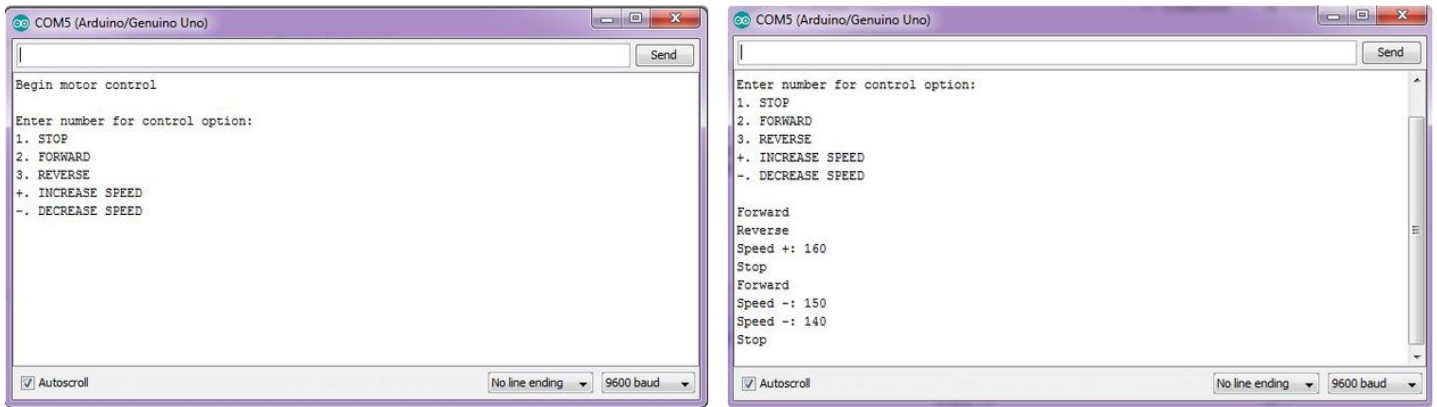

Step 5: Results

This is the result of this tutorial :

i. when user enter number '2', gear motor start to rotate forward and serial monitor will print forward.

ii. when user enter '3', gear motor start to reverse and serial monitor will print reverse.

iii. when user enter '+', gear motor's speed increase by 10 and serial monitor will print the motor's speed. However, gear motor maximum speed is 255, thus, when user enter '++' more it will still print 255 and

never more than 255 (as shown in the pic).

iv. when user enter '-', gear motor's speed decrease by 10 and serial monitor will print the motor's speed. However, gear motor minimum speed is 0, thus, when user enter '--' more it will still print 0 and never less than 0 (as shown in the pic).

iv. when user enter '1', gear motor stop from rotating and serial monitor will print stop.

```
COM5 (Arduino/Genuino Uno)

|                                              | Send |

Begin motor control

Enter number for control option:
1. STOP
2. FORWARD
3. REVERSE
+. INCREASE SPEED
-. DECREASE SPEED




☑ Autoscroll          No line ending ▼   9600 baud ▼
```

```
COM5 (Arduino/Genuino Uno)

|                                              | Send |

Enter number for control option:
1. STOP
2. FORWARD
3. REVERSE
+. INCREASE SPEED
-. DECREASE SPEED

Forward
Reverse
Speed +: 160
Stop
Forward
Speed -: 150
Speed -: 140
Stop

☑ Autoscroll          No line ending ▼   9600 baud ▼
```

Step 6: Video

This video demonstration show how the gear motor function according to the sample source code.

https://www.youtube.com/watch?v=NDtwgl4ar0w