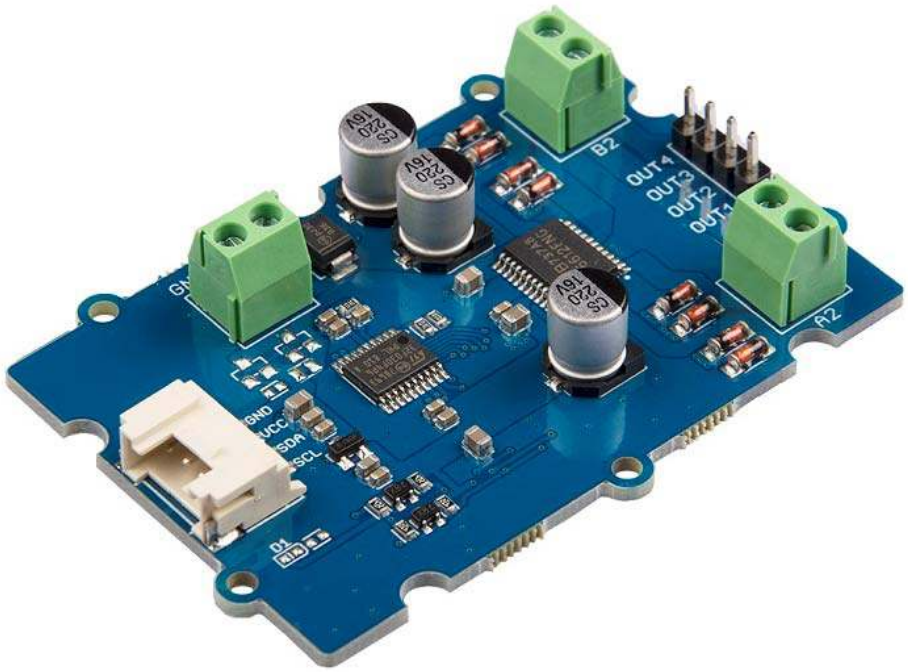
Grove - I2C Motor Driver (TB6612FNG)



The Grove - I2C Motor Driver (TB6612FNG) can drive two DC motors up to 12V/1.2A or drive one stepper motor up to 12V/1.2A. With the on-board MCU, it can work with Arduino easily via the Grove I2C interface.

This diver board is based on TB6612FNG, which is a driver IC for DC motor and stepper motor with output transistor in LD MOS structure with low ON-resistor. Two input signals, IN1 and IN2, can choose one of four modes such as CW, CCW, short brake, and stop mode.

Features

- On board MCU
- CW/CCW/short brake/stop function modes
- Built-in thermal shutdown circuit and low voltage detecting circuit
- Standby (Power save) system

Specification

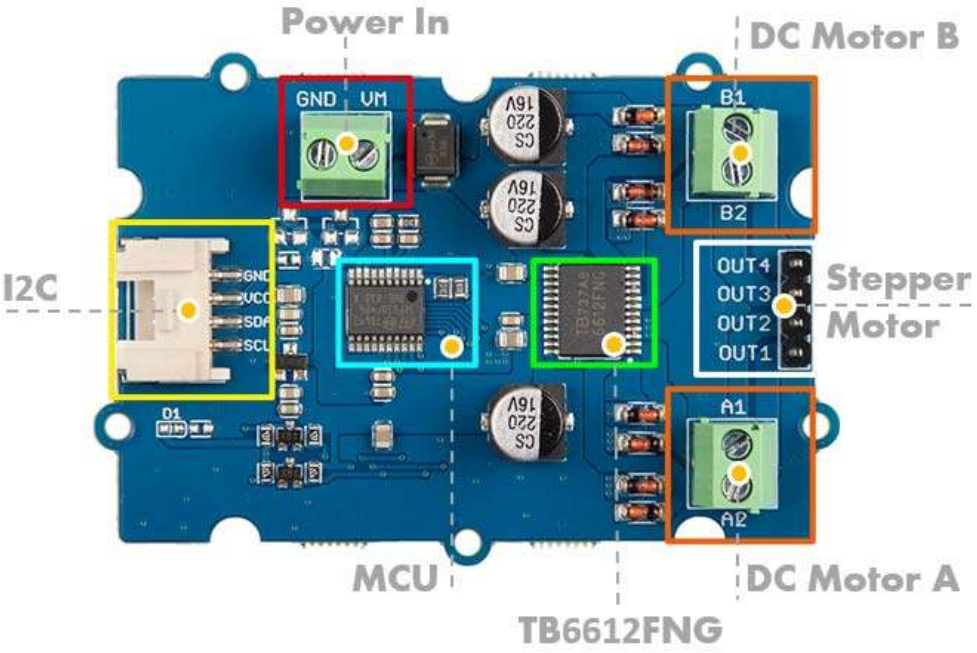
Item	Value
MCU Operating Voltage	3.3V / 5V
Motor Supply Voltage	2.5 ~ 13.5 (5V Typical, 15V Max.)
Output Current	1.2 A(ave)/3.2 A (peak)
Switching Frequency	100kHz
Logic Interface	I2C
I2C Address	0x14 (default)
I2C Address Range	0x01 ~ 0x7f (Configurable)

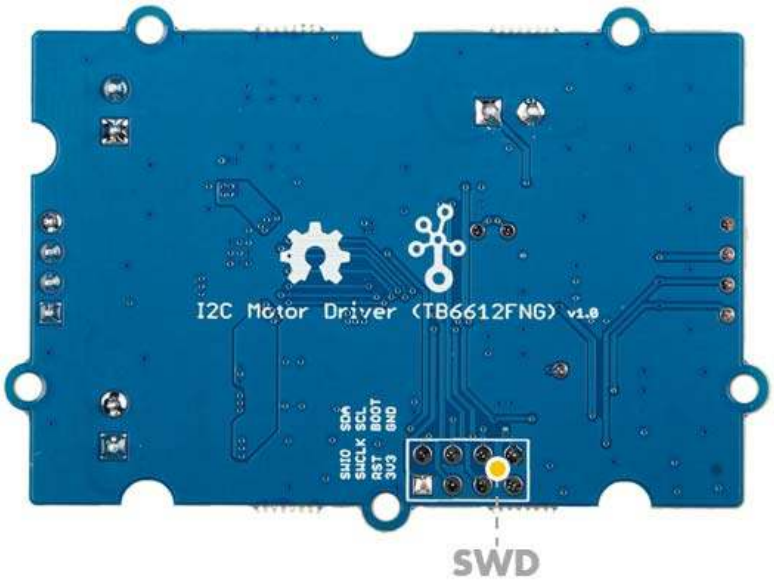
Typical applications

- DC motor control
- Stepper motor control

Hardware Overview

Pin Out



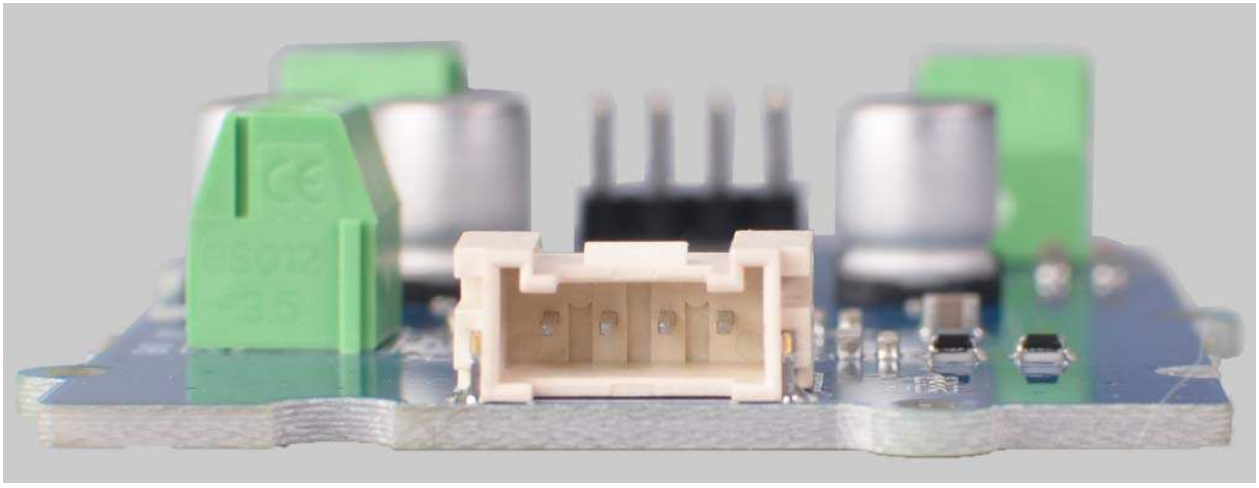


Hardware Detail

I2C Interface

This board uses the I2C interface to allow the on-board MCU to communicate with the host computer.

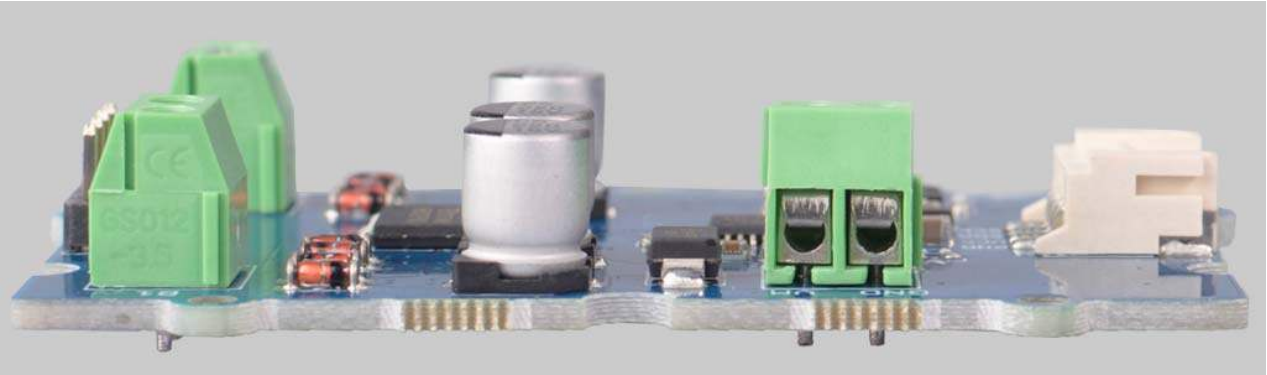
GND: connect this module to the system GND
VCC: you can use 5V or 3.3V for this module
SDA: I2C serial data
SCL: I2C serial clock



Power In

Provide DC power to the motors, input range 2.5V ~ 13.5V.

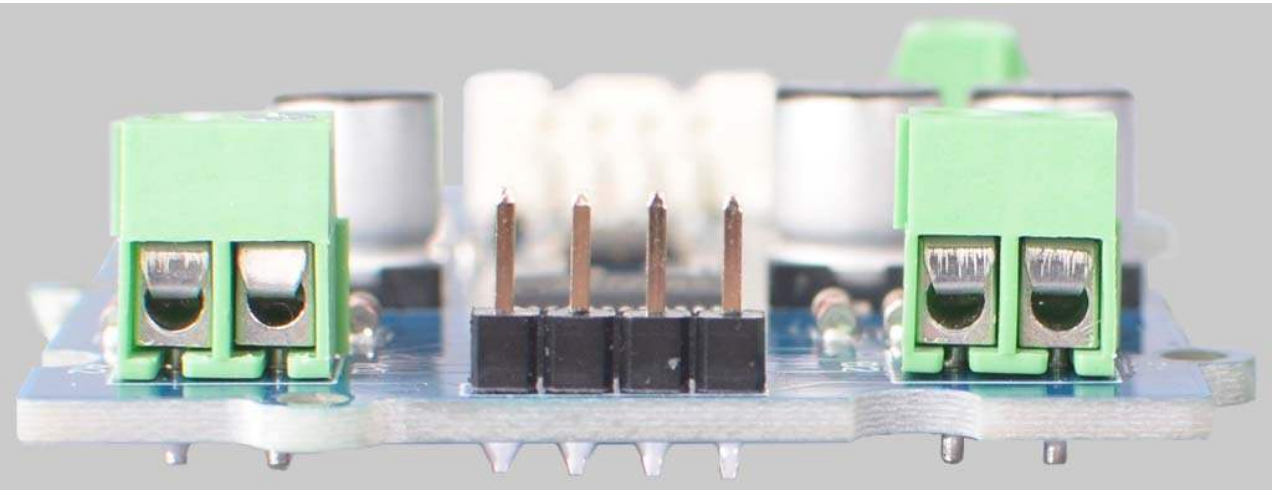
GND: Connect to the system GND, plug the power "-"
VM: Plug the power "+", supply power for the motor.



DC Motor Output

This board has two channel DC Motor Output, it can output 12V/1.2A per channel. You can use this driver board control two DC motors at the same time.

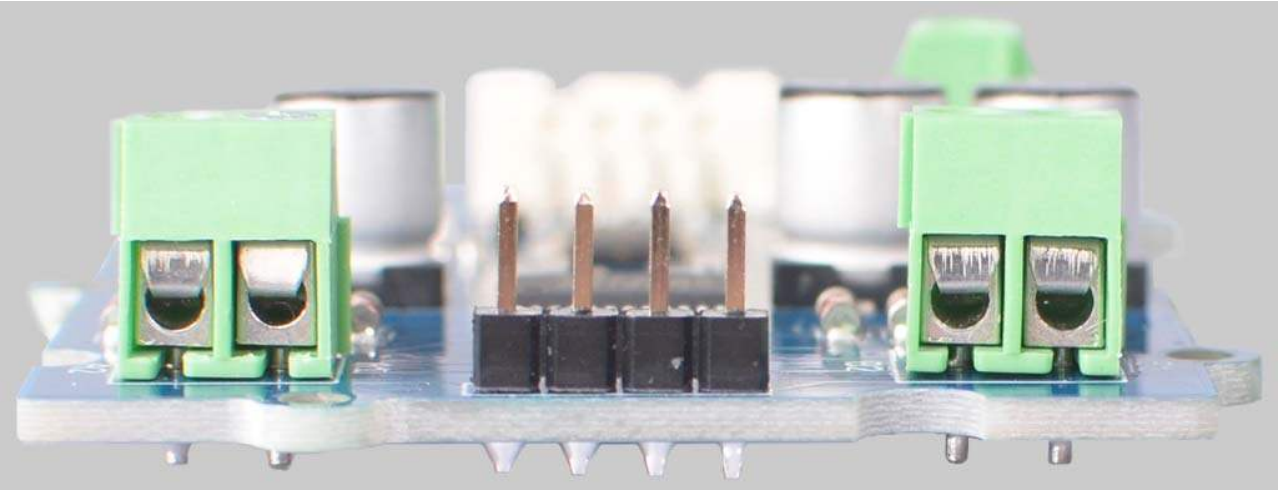
A1: Channel A output 1
A2: Channel A output 2
B1: Channel B output 1
B2: Channel B output 2



Steperp Motor Output

You can use this board to control the 4-wire stepper motor as well, it can output up to 12V/1.2A.

OUT1: Connected to one input of the stepper motor coil 1.
OUT2: Connected to the other input of the stepper motor coil 1.
OUT3: Connected to one input of the stepper motor coil 2.
OUT4: Connected to the other input of the stepper motor coil 2.



Note
Actually the DC port and the stepper port are physically connected together. The connection diagram is as follows:

DC Port	Stepper Port
A1	OUT1
A2	OUT2
B1	OUT3
B2	OUT4

Platforms Supported

Arduino	Raspberry Pi	BeagleBone	Wio	LinkIt ONE

Caution
The platforms mentioned above as supported is/are an indication of the module's hardware or theoritical compatibility. We only provide software library or code examples for Arduino platform in most cases. It is not possible to provide software library / demo code for all possible MCU platforms. Hence, users have to write their own software library.

Getting Started

Play With Arduino

Hardware

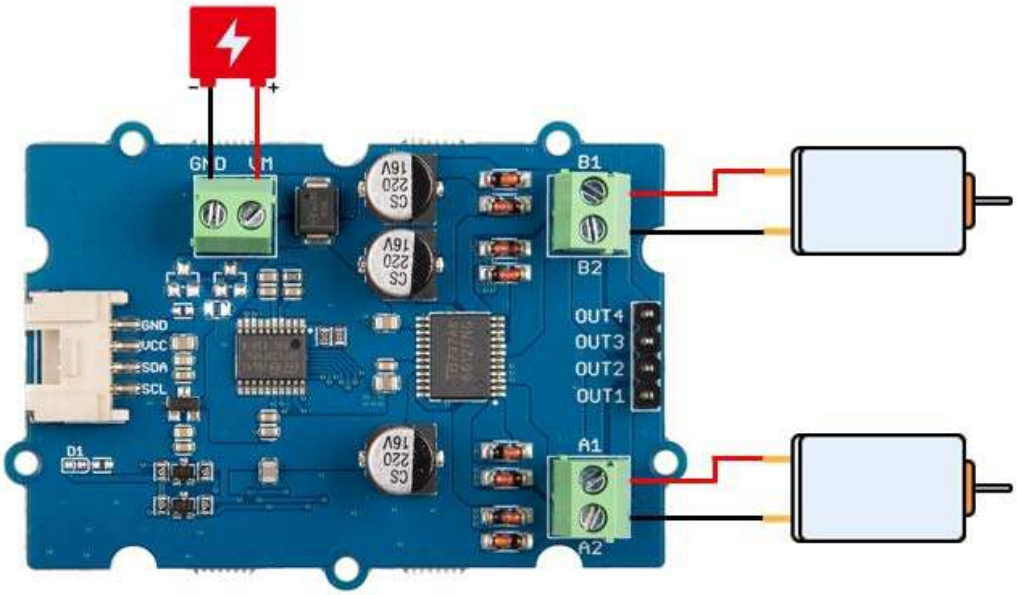
Materials required

DC Motor Demo

Seeeduino V4.2	Base Shield	Grove - I2C Motor Driver (TB6612FNG)	DC Motor

Note
1 Please plug the USB cable gently, otherwise you may damage the port. Please use the USB cable with 4 wires inside, the 2 wires cable can't transfer data. If you are not sure about the wire you have, you can click here to buy
2 Each Grove module comes with a Grove cable when you buy. In case you lose the Grove cable, you can click here to buy.
3 You also need prepare at least 2 jumpers, in case you do not have, you can click here to buy.

- **Step 1.** Plu the DC motor into the **DC Motor Output** port of the driver board, plug the external DC power into the **Power In** port.
- **Step 2.** Connect the Grove - I2C Motor Driver (TB6612FNG) to port **I²C** of Grove-Base Shield.
- **Step 3.** Plug Grove - Base Shield into Seeeduino.
- **Step 4.** Connect Seeeduino to PC via a USB cable.



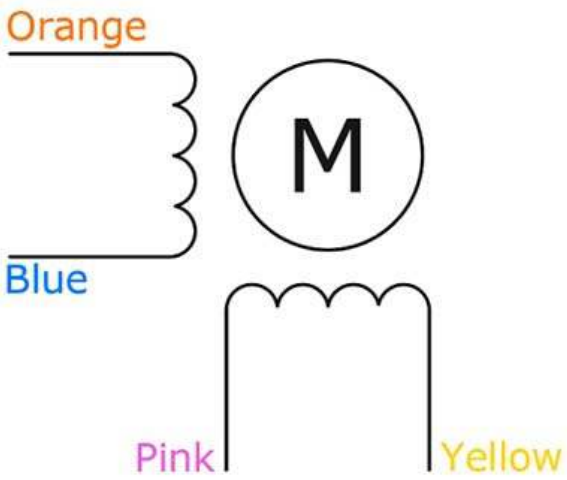
Stepper Motor Demo

Seeeduino V4.2	Base Shield	Grove - I2C Motor Driver (TB6612FNG)	Stepper Motor

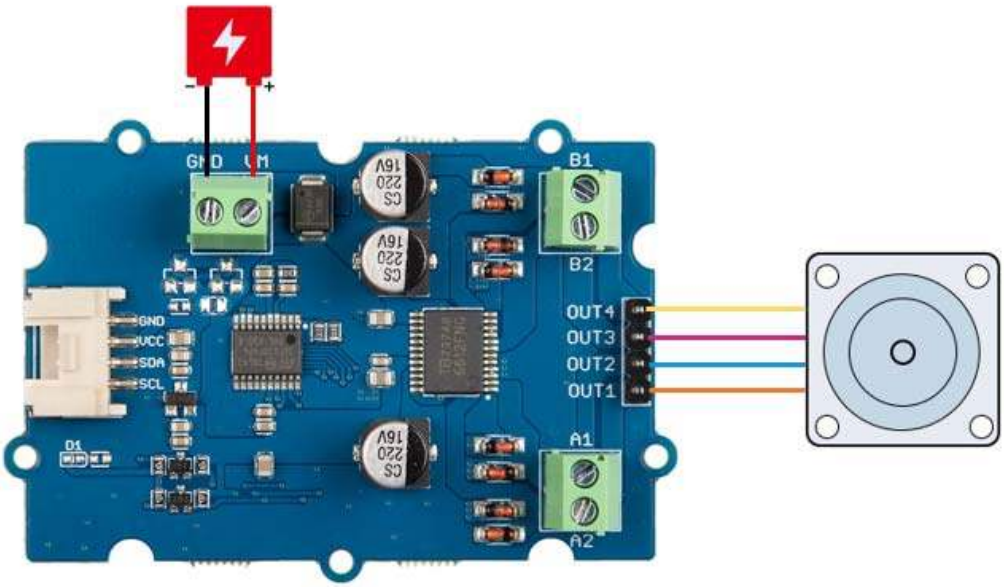
- **Step 1.** Connect the stepper motor with **Stepper Motor Output** port of the driver board, plug the external DC power into the **Power In** port.

Tip
This driver board is suitable for 4-wire stepper motors. Depending on the stepper motor you use, the wiring color is different. We use the motor 24BYJ48 , the wiring is as shown in the table below:

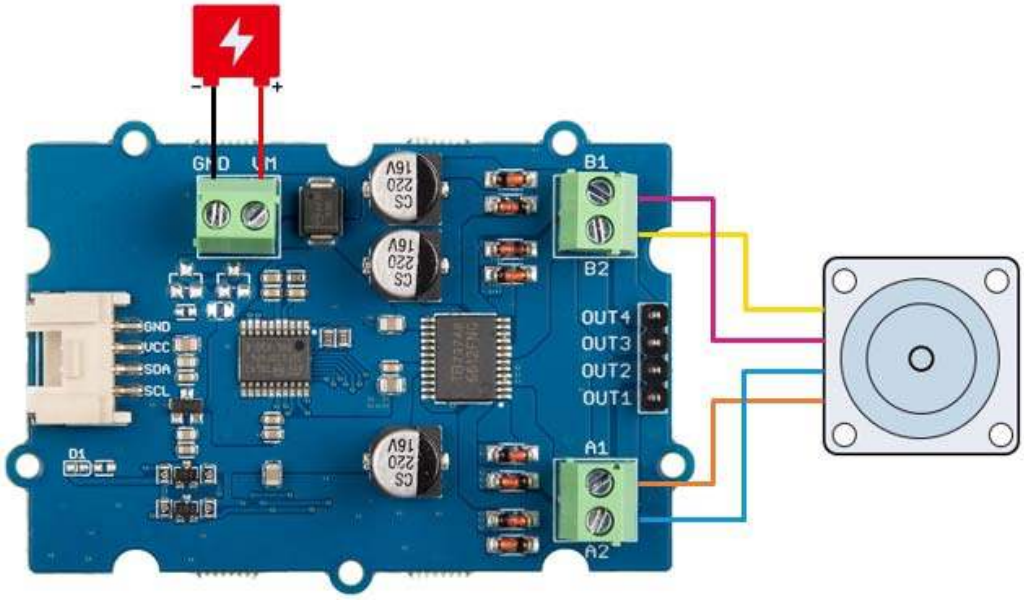
Pin Name	Wire of Stepper Motor	Wire color(24BYJ48)
OUT1	one end of coil 1	Orange
OUT2	the other end of coil 1	Blue
OUT3	one end of coil 2	Pink
OUT4	the other end of coil 2	Yellow



- **Step 2.** Connect the Grove - I2C Motor Driver (TB6612FNG) to port **I²C** of Grove-Base Shield.
- **Step 3.** Plug Grove - Base Shield into Seeeduino.
- **Step 4.** Connect Seeeduino to PC via a USB cable.



Note
Since the DC port and the stepper port are physically connected together, you can also use the two DC port to control your stepper motor. The connection diagram is as follows:



Note
If we don't have Grove Base Shield, We also can directly connect this module to Seeeduino as below.

Seeeduino	Grove Cable	Grove - I2C Motor Driver (TB6612FNG)
GND	Black	GND
5V or 3.3V	Red	VCC
SDA	White	SDA
SCL	Yellow	SCL

Software

Attention
If this is the first time you work with Arduino, we strongly recommend you to see Getting Started with Arduinobefore the start.

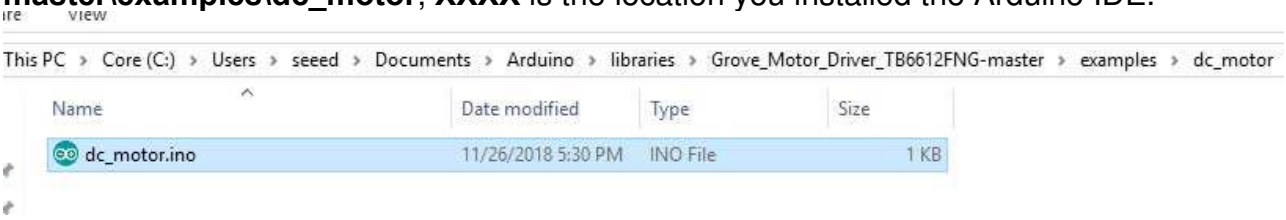
- **Step 1.** Download the Grove_Motor_Driver_TB6612FNG Library from Github.
- **Step 2.** Refer to How to install library to install library for Arduino.
- **Step 3.** Restart the Arduino IDE. Open the default example, we provide two examples for you

dc_motor: Demo for DC motor
stepper_motor_2phase: Demo for 4-wire, 2phase stepper motor.

You can open them in the following two ways(take the dc_motor for example) :
1. Open it directly in the Arduino IDE via the path: **File → Examples → Grove - Motor Driver(TB6612FNG) → dc_motor**.

2. Open it in your computer by click the **dc_motor.ino** which you can find in the folder **XXXX\Arduino\libraries\Grove_Motor_Driver_TB6612FNG-**

master\examples\dc_motor, **XXXX** is the location you installed the Arduino IDE.



- **Step 4.** Upload the demo. If you do not know how to upload the code, please check How to upload code.

Success
If every thing goes well, when you power up the external power port, the motor will run.

Tech Support

Please do not hesitate to submit the issue into our forum or drop mail to techsupport@seeed.cc.