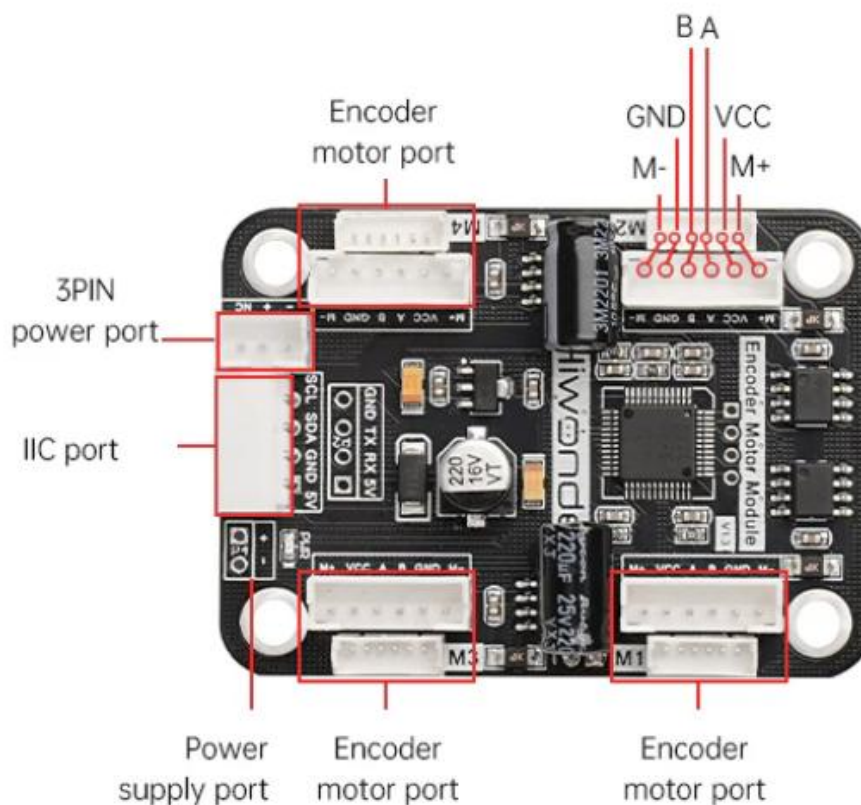


# Introduction to 4-Ch Encoder Motor Driver

## 1. Product Introduction

## 1.1 Module Introduction

The 4-ch encoder motor driver can be used to drive TT motors or Hall encoder motors with a microcontroller. Its voltage range is DC 3V to 12V, depending on the voltage of the connected motor. The interface distribution is shown in the following figure:



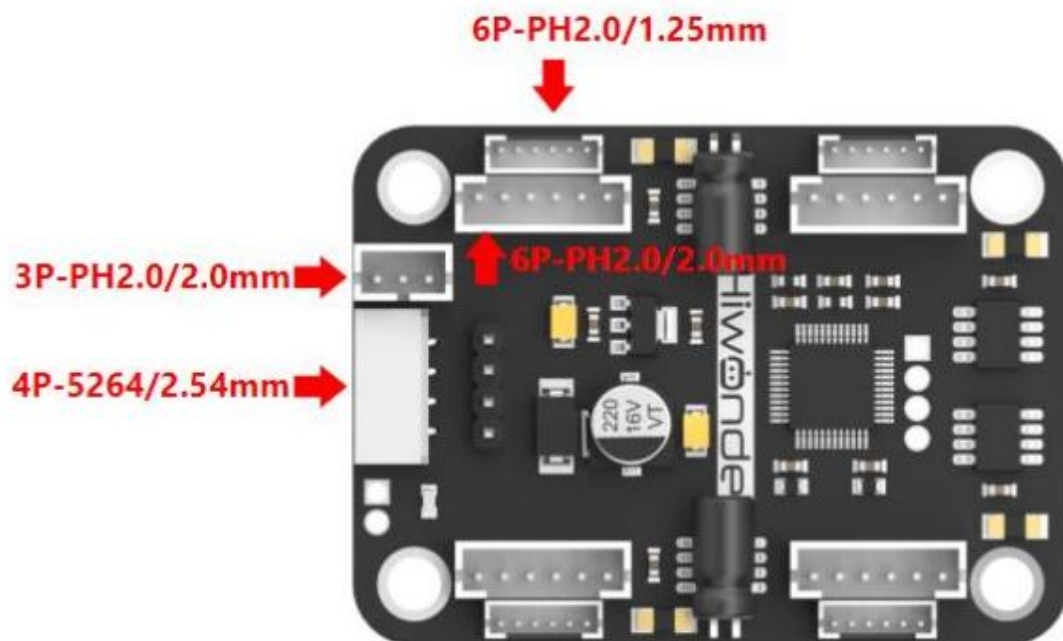
**Note:** To ensure stable operation of the driver module, avoid using the same power supply for both the driver and other high-power devices. Doing so can cause the module to become unstable.

Starting from **version v1.4**, the **5V pin on the serial interface** has been changed to **NC (not connected)** to prevent accidental power conflicts.

Recommended power setup:

1. **Use separate power sources** for the main controller and the motor driver module.
  2. Alternatively, **use a DC-DC buck converter**:
    - Power the **motor driver module** with the original (higher) voltage.
    - Power the **main controller** with the stepped-down voltage from the converter.
- 

The port type is as below:



- 1) 6P-PH2.0/1.25mm: Connects to the TT motor whose pin order is different from that of the encoder motor.
- 2) 6P-PH2.0/2.0mm: Applicable to the the DC encoder motor.

The interface instruction is as below:

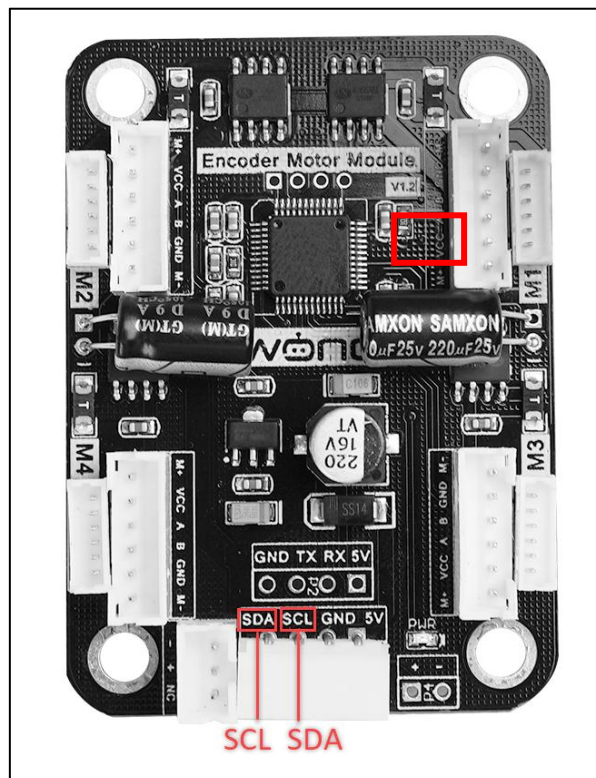
Port Type	Symbol	Function
Encoder	GND	Hall power supply negative

		electrode
	A	A-phase pulse signal output terminal
	B	B-phase pulse signal output terminal
	VCC	Hall power positive electrode
	M+	Motor power positive electrode
	M-	Motor power negative electrode
<p>Note:</p> <p>1.The voltage between VCC and GND is determined by the voltage of the microcontroller used. It is generally 3.3V or 5V.</p> <p>2.When the shaft rotates clockwise, the output pulse A channel signal is before the B channel signal; when the shaft rotates counterclockwise, the A channel signal is after the B channel signal.</p> <p>3.The voltage between M+ and M- is determined by the voltage of the motor used.</p>		
IIC Port	SCL	Clock line
	SDA	Bidirectional data cable
	GND	Power ground wire
	5V	5V DC output
3PIN power port	-	Power negative electrode
	+	Power positive electrode
	nc	Empty

Power supply port	+	Power positive electrode
	-	Power negative electrode

Note:

- 1.The presence of diodes in the I2C interface's 5V interface may cause the voltage to appear higher than it actually is. However, this pin only supports input and no current actually passes through it. Do not worry about voltage-related issues.
- 2.It is recommended to use a power supply that corresponds to the voltage of the motor. For example: if you need to drive a 5V motor, use a 5V power supply.
- 3.The mark of the SDA and SCL interfaces on version V1.2 is incorrect. Subsequent versions have been corrected. The correct positions of SCL and SDA are indicated by the red markings in the following figure:



## 1.2 Wiring Instruction

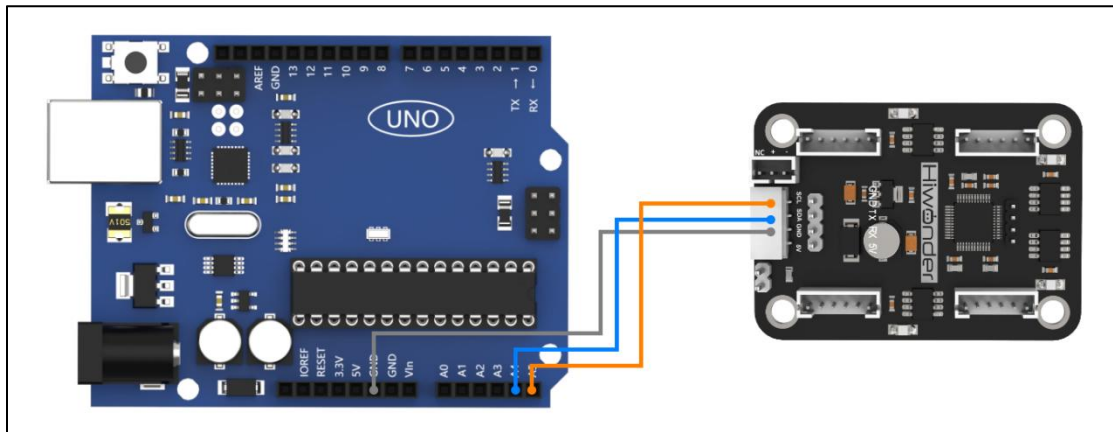
### 1.2.1 Power Supply Wiring

Taking I2C communication with the Arduino UNO as an example, the power

supply and corresponding wiring methods are shown below:

1) Connect the encoder motor module to the Arduino UNO with three male-to-female DuPont wires, based on the following instruction.

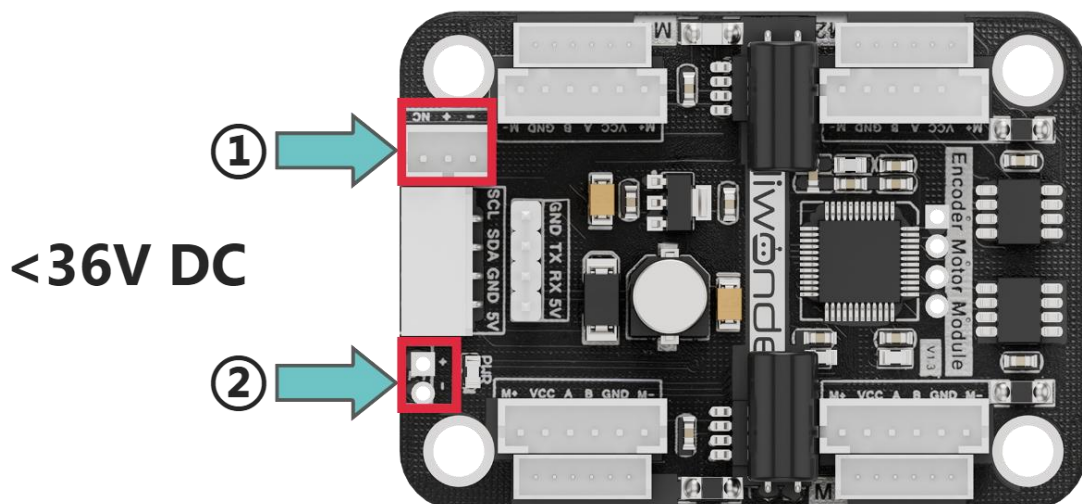
The SDA, SCL, and GND pins on the module should be connected to the A4 (SDA), A5 (SCL), and GND interfaces on the Arduino UNO, respectively, as shown in the figure below:



2) The I2C ports (5V, GND, SCL, SDA) on the motor driver module cannot be used directly for power supply. This 5V pin only supports voltage input and cannot output voltage. Therefore, please use the 5V pin on the motor driver module's serial port to power the Arduino UNO. The 5V pin on the serial port can support both input and output of 5V voltage.

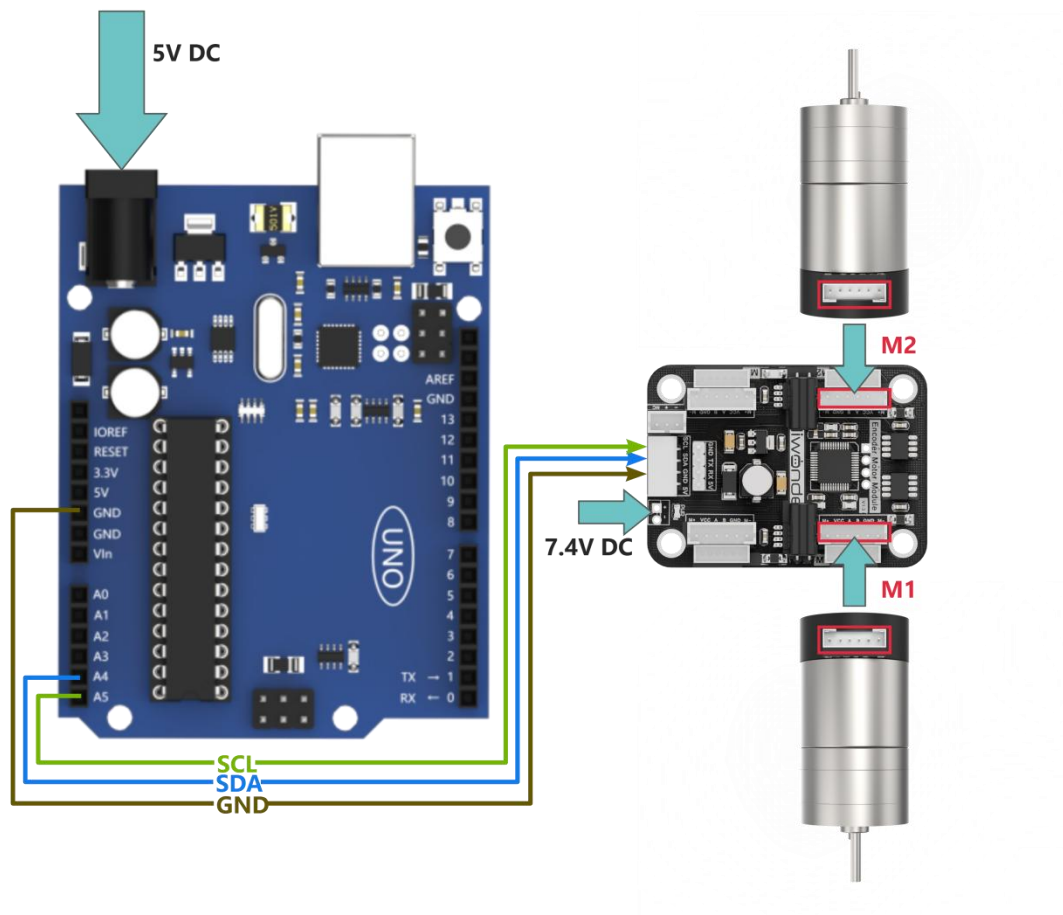
Let's take a look at the external power supply of the encoder motor driver.

There are two ways to supply power, as shown in the figure below:



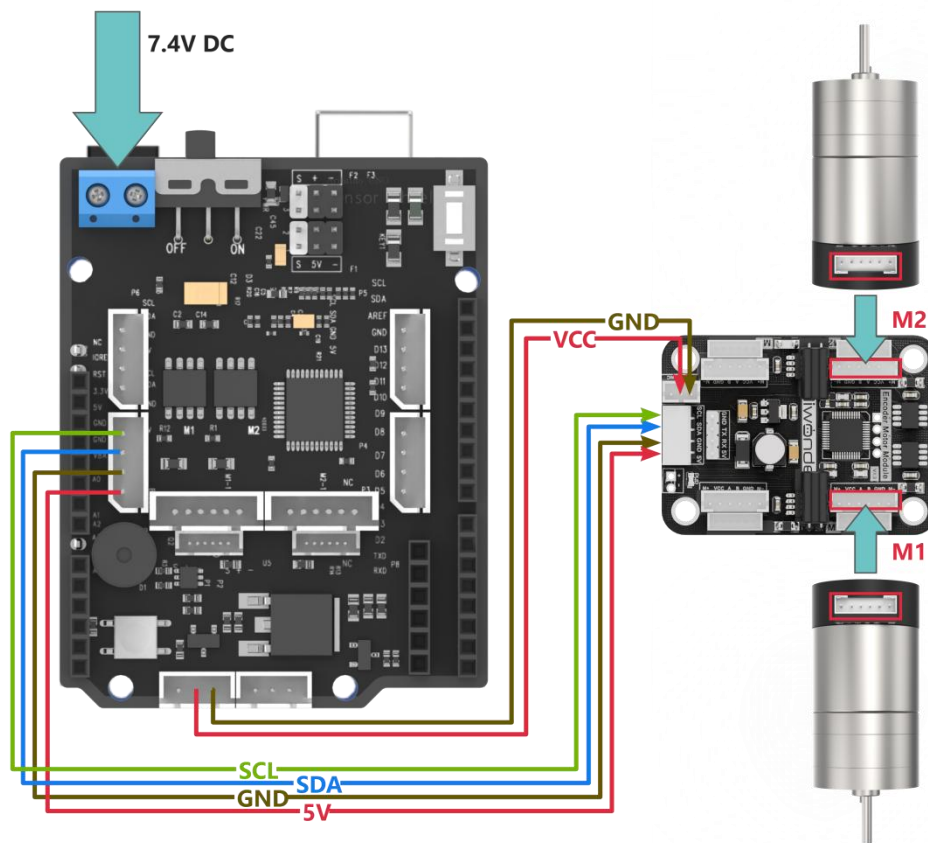
The following diagram illustrates the recommended power wiring between the motor driver module and the Arduino:

Option 1: Power the main controller and motor driver module separately



Option 2: Power the main controller and motor driver module using different voltages via a DC-DC buck converter.





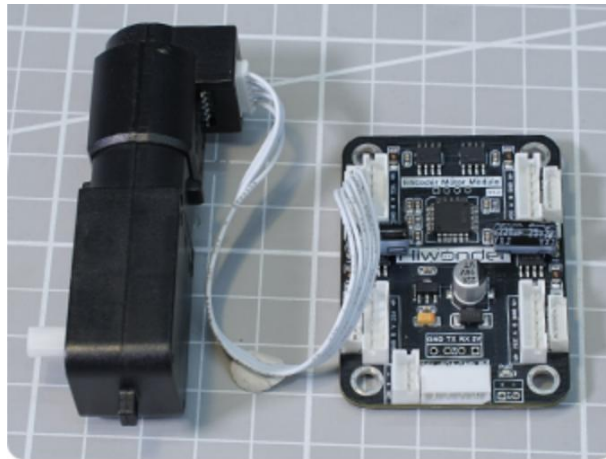
**Note:** If you're using a third-party battery, make sure it provides the correct voltage and has a discharge rate of at least **3C** to ensure reliable performance.

3) Once the module is powered on and operating normally, the onboard PWR LED will indicate the current power status. The details are as follows:

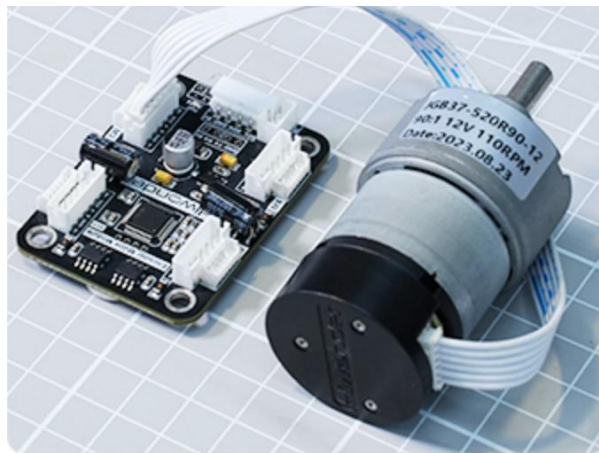
Module Working Status	PWR Indicator Working Status
Normal	Steadily lit (V1.3 & previous version)
	Flicker (v1.4 version)
Power off	Go out

## 1.2.2 Motor Wiring

- 1) The TT motor uses a different wiring sequence than the encoder motor, so it must be connected to a 6P-PH2.0/1.25mm type interface. Do not connect it to other ports, as this may cause a short circuit.



- 2) The encoder motor should be connected using motor wires to a 6P-PH2.0/2.0mm type interface.



## 2. Introduction to the Register

Refer to the table below for details:

Register Name	Address	Function
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ADC_BAR_ADDR	0x00	ADC battery voltage sampling
MOTOR_TYPE_ADDR	0x14	Motor type setting for encoder motors. Currently supports 4 types:
		① 0 – Motor without encoder (44-wire, gear ratio 1:90)
		② 1 – TT encoder motor (3-wire, gear ratio 1:84, compatible with our high-speed metal-shaft encoder motor)
		③ 2 – N20 encoder motor (13-wire, gear ratio 1:20, compatible with our JGA27-310R20 motor)
		④ 3 – JGB encoder motor (11-wire, gear ratio 1:90, compatible with our JGB37-520R90-12 motor)
MOTOR_ENCODER_POLARITY_ADDR	0x15	Sets encoder polarity (direction control)
MOTOR_FIXED_PWM_ADDR	0x1F	Fixed PWM control (open-loop), range: -100 to

		100
MOTOR_FIXED_SPEED_ADDR	0x33	Fixed speed control (closed-loop)
MOTOR_ENCODER_TOTAT_ADDR	0x3C	Total pulse count for each of the 4 encoder motors. Writing 0 resets the count.

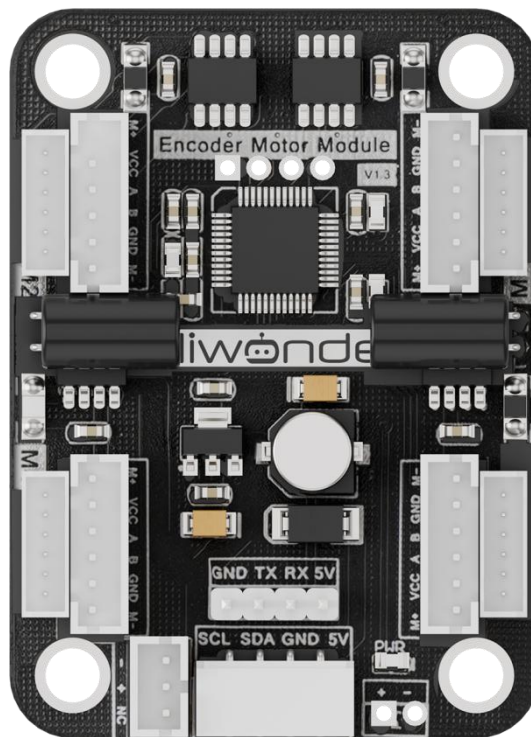
Notes:

1. When using register **0x15** to set encoder polarity, make sure to set the value to **0**. Otherwise, the motor may keep rotating in one direction and won't respond to direction changes.
2. To reset the encoder pulse counts, write sixteen bytes of 0x00 to register 0x3C.

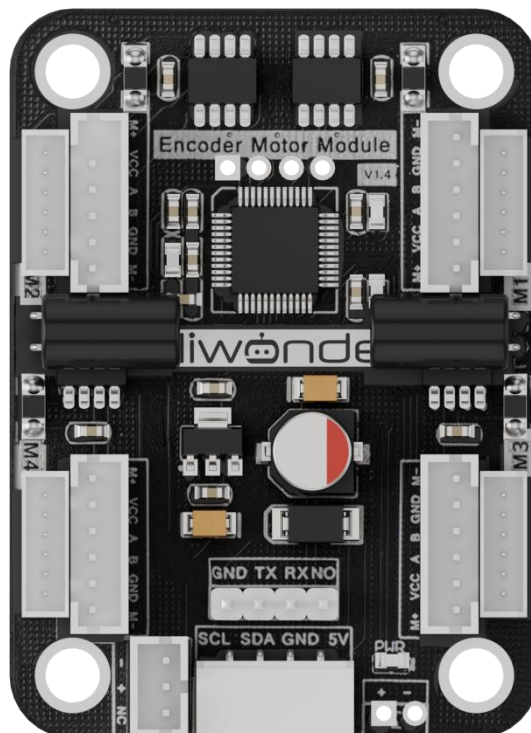
### 3. Version Description

Version	Notice
<b>V1.2</b>	In this version, the SDA and SCL pin labels are incorrectly printed. Please be sure to reverse the connections when using these two pins.
<b>V1.3</b>	This labeling error has been corrected in the updated version.
<b>V1.4</b>	To ensure stable power supply, the original "5V" output pin near the serial port has been redesigned as a floating "NC" (Not Connected) pin.

The following are appearance images of certain module versions, provided for reference only.



[ v1.3 ]



[ v1.4 ]