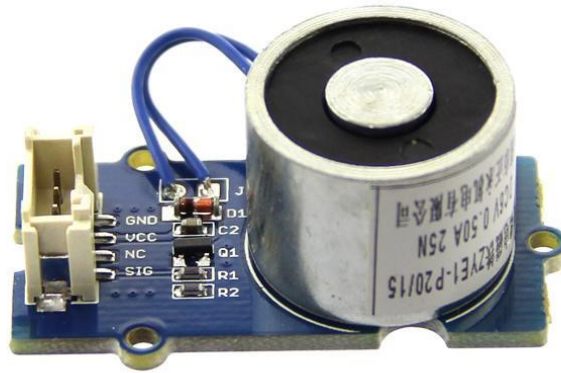


# Grove - Electromagnet



An electromagnet is a type of magnet in which the magnetic field is produced by electric current. An electric current flowing in a wire creates a magnetic field around the wire, due to Ampere's law(see drawing below). To concentrate the magnetic field, in an electromagnet the wire is wound into a coil with many turns of wire lying side by side. The magnetic field of all the turns of wire passes through the center of the coil, creating a strong magnetic field there. Grove - Electromagnet can suck 1KG weight and hold on. It is easy to use, to learn electromagnet principle.

## Features

- Grove shape
- 1KG peak suction
- Low standby current

## Specifications

<u>Item</u>	<u>Value</u>
Working Voltage	DC 5V
Working Current	400mA
Standby Current	200uA
Load Weight	1KG

## Tip

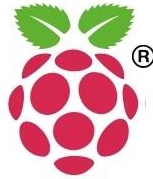
More details about Grove modules please refer to [Grove System](#)

## Platforms Supported

Arduino



Raspberry



BeagleBone



Wio



LinkIt



### Caution

The platforms mentioned above as supported is/are an indication of the module's hardware or theoretical 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

### Note

If this is the first time you work with Arduino, we firmly recommend you to see [Getting Started with Arduino](#) before the start.

## Play With Arduino

### Hardware

- Step 1. Prepare the below stuffs:

### Seeeduino



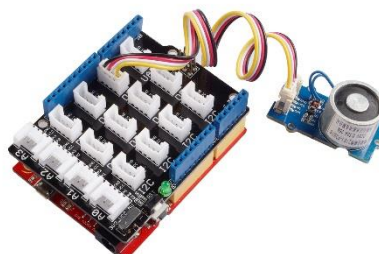
### Base Shield



### Grove Electromagnet



- Step 2. Connect Grove-Electromagnet to port D2 of Grove-Base Shield.
- Step 3. Plug Grove - Base Shield into Seeeduino.
- Step 4. Connect Seeeduino to PC via a USB cable.



## Note

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

<u>Seeeduino</u>	<u>Grove-Ultrasonic Ranger</u>
5V	Red
GND	Black
Not Connected	White
D2	Yellow

## Software

- Step 1. Please copy below code to Arduino IDE and upload to arduino. If you do not know how to upload the code, please check [how to upload code](#).

```
• /*  
• Turns on an Electromagnet on for one second, then off for one second, repeatedly.  
• This example code is in the public domain.  
• */  
•  
•  
• int Electromagnet = 0;  
• int LED = 13;  
•  
• // the setup routine runs once when you press reset:  
• void setup() {  
•     // initialize the digital pin as an output.  
•     pinMode(Electromagnet, OUTPUT);  
•     pinMode(LED, OUTPUT);  
• }  
•  
• // the loop routine runs over and over again forever:  
• void loop() {  
•     digitalWrite(Electromagnet, HIGH); // turn the Electromagnet on (HIGH is the voltage  
level)  
•     digitalWrite(LED, HIGH);           // turn the LED on (HIGH is the voltage level)  
•     delay(1000);                       // wait for a second  
•     digitalWrite(Electromagnet, LOW);  // turn the Electromagnet off by making the voltage  
LOW  
•     digitalWrite(LED, LOW);           // turn the LED off by making the voltage LOW  
•     delay(1000);                       // wait for a second  
• }  
•
```

- Step 2. Grove-Electromagnet worked.



## Play With Raspberry Pi

### Hardware

- Step 1. Prepare the below stuffs:

#### Raspberry pi



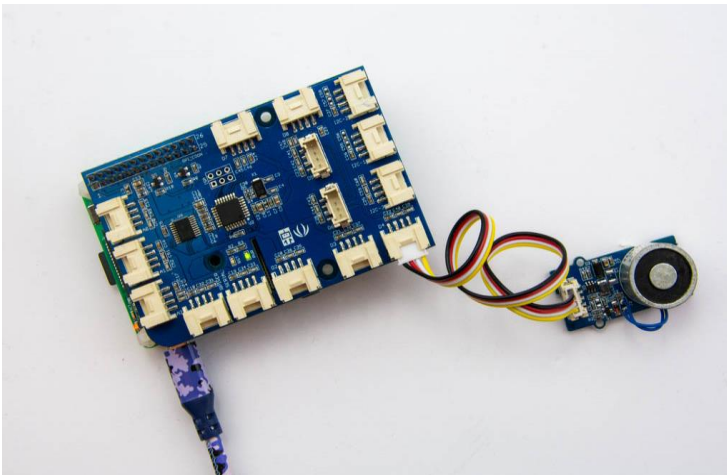
#### GrovePi Plus



#### Grove-Electromagnet



- Step 2. Plug the GrovePi\_Plus into Raspberry.
- Step 3. Connect Grove-Electromagnet to D4 port of GrovePi\_Plus.
- Step 4. Connect the Raspberry to PC through USB cable.



### Software

- Step 1. Follow [Setting Software](#) to configure the development environment.
- Step 2. Follow [Updating the Firmware](#) to update the newest firmware of GrovePi.

#### Tip

In this wiki we use the path ~/GrovePi/ instead of /home/pi/Desktop/GrovePi, you need to make sure Step 2 and Step 3 use the same path.

#### Note

We firmly suggest you to update the firmware, or for some sensors you may get errors.

- Step 3. Git clone the Github repository.

```
1cd ~
```

```
2git clone https://github.com/DexterInd/GrovePi.git
```

- Step 4. Navigate to the demos' directory:

```
1cd yourpath/GrovePi/Software/Python/
```

Here is the grove\_electromagnet.py code.

```
1  import time
2  import grovepi
3
4  # The electromagnet can hold a 1KG weight
5
6  # Connect the Grove Electromagnet to digital port D4
7  # SIG,NC,VCC,GND
8  electromagnet = 4
9
10 grovepi.pinMode(electromagnet,"OUTPUT")
11 time.sleep(1)
12
13 while True:
14     try:
15         # Switch on electromagnet
16         grovepi.digitalWrite(electromagnet,1)
17         print "on"
18         time.sleep(2)
19
20         # Switch off electromagnet
21         grovepi.digitalWrite(electromagnet,0)
22         print "off"
23         time.sleep(2)
24
25     except KeyboardInterrupt:
26         grovepi.digitalWrite(electromagnet,0)
27         break
28     except IOError:
29         print "Error"
```

5.Run the demo.

```
1  sudo python grove_electromagnet.py
```

## Resources

- [\[Eagle\]Grove Electromagnet v1.0 SCH PCB.zip](#)
- [\[Datasheet\]Datasheet ZYE1-P20-15 PDF](#)

## Tech Support

Please submit any technical issue into our [forum](#).