Grove - Electromagnet

Introduction

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

Tip

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

Specifications

- Working Voltage ： DC 5V
- Working Current ： 400mA
- Standby current ： 200uA
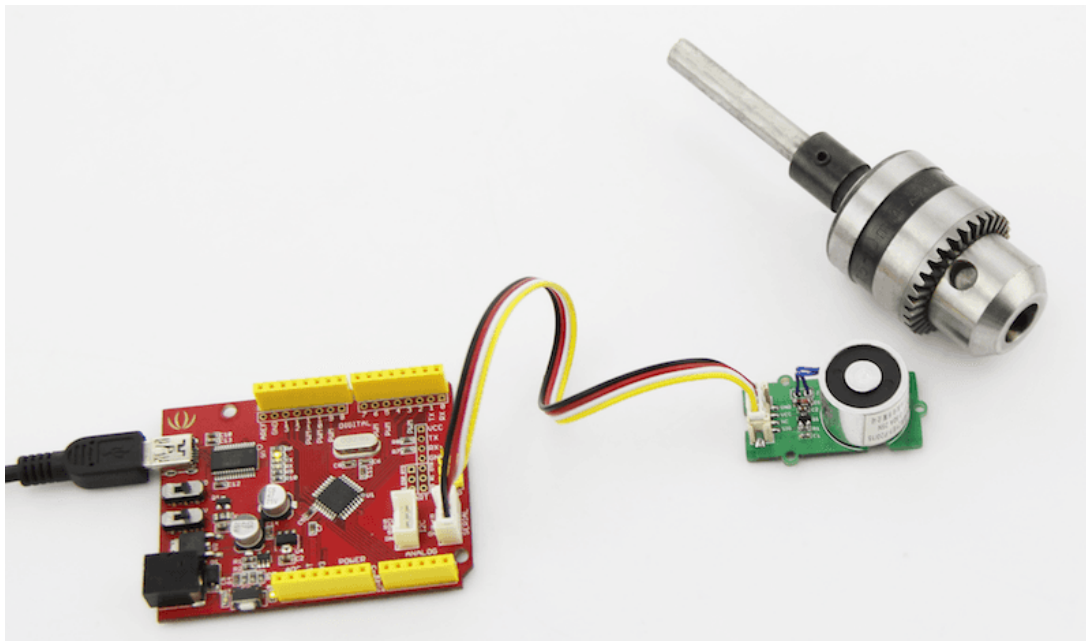- Load Weight： 1KG

Platforms Supported
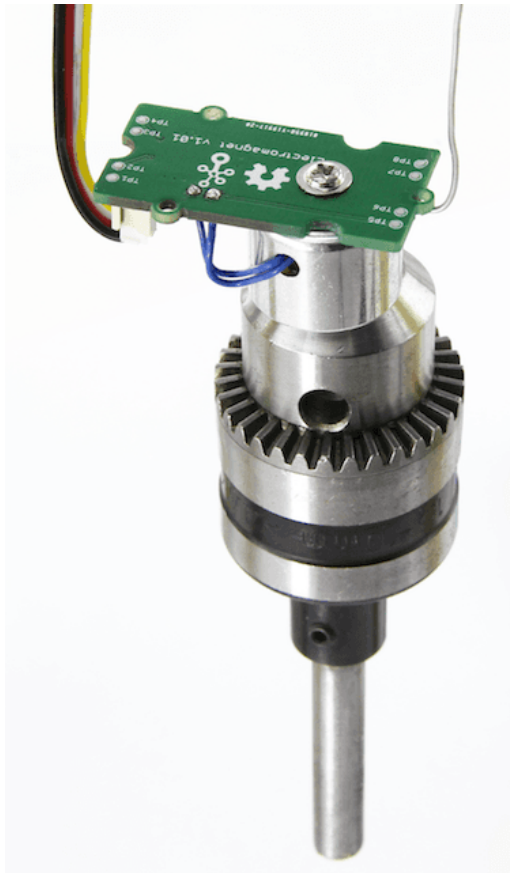
Arduino	Wio	BeagleBone	Raspberry Pi	LinkIt ONE

Usage

With Arduino

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
}
```

With Raspberry Pi

1.You should have got a raspberry pi and a grovepi or grovepi+.

2.You should have completed configuring the development enviroment, otherwise follow [here](#).

3.Connection

- Plug the sensor to grovepi socket D4 by using a grove cable.

4.Navigate to the demos' directory:

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

- To see the code

```
nano grove_electromagnet.py   # "Ctrl+x" to exit #
import time
import grovepi

# The electromagnet can hold a 1KG weight

# Connect the Grove Electromagnet to digital port D4
# SIG,NC,VCC,GND
electromagnet = 4
```

```python
    grovepi.pinMode(electromagnet,"OUTPUT")
    time.sleep(1)

    while True:
        try:
            # Switch on electromagnet
            grovepi.digitalWrite(electromagnet,1)
            print "on"
            time.sleep(2)

            # Switch off electromagnet
            grovepi.digitalWrite(electromagnet,0)
            print "off"
            time.sleep(2)

        except KeyboardInterrupt:
            grovepi.digitalWrite(electromagnet,0)
            break
        except IOError:
            print "Error"
```

5.Run the demo.

```
sudo python grove_electromagnet.py
```