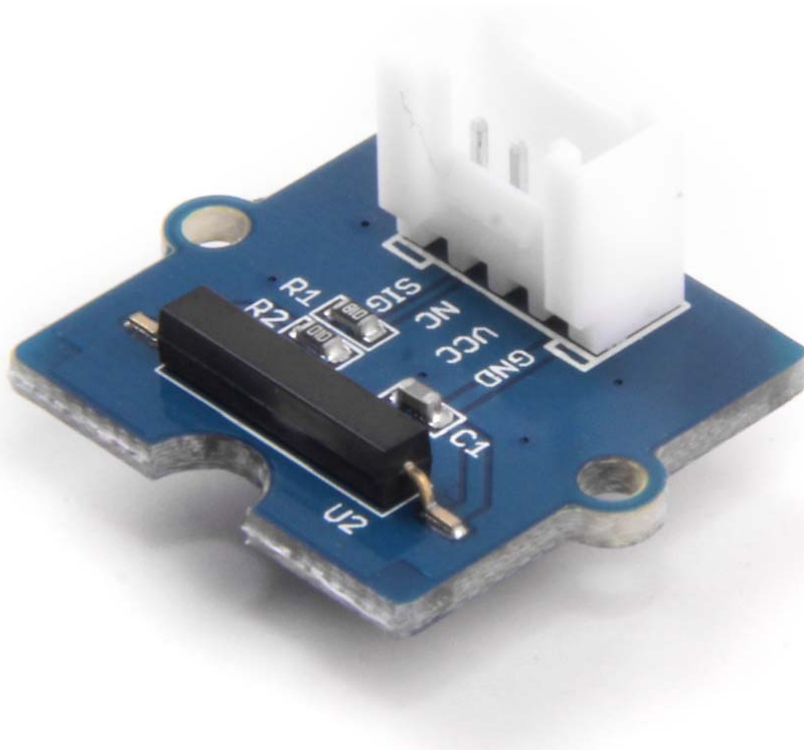# Grove - Magnetic Switch



This is a Grove interface compatible Magnetic switch module. It is based on encapsulated dry reed switch CT10. CT10 is single-pole, single throw (SPST) type, having normally open ruthenium contacts. The sensor is a double-ended type and may be actuated with an electromagnet, a permanent magnet or a combination of both. The magnetic switch is a wonderful tool for designers who would like to turn a circuit on and off based on proximity.

## Features

- Grove compatible interface
- 2.0cm x 2.0cm Grove module
- Minimum external parts
- 10W rating
- Rugged encapsulation

**Tip**
More details about Grove modules please refer to Grove System

## Application Ideas

- Proximity Sensor
- Security Alarm Sensor
- Level Sensor
- Flow Sensor
- Pulse Counter

## Specifications

| Items | Min | Norm | Max | Unit |
|---|---|---|---|---|
| Working Voltage | 4.75 | 5.0 | 5.25 | V |
| Switched Power | 10 | | | W |
| Switched Voltage AC,RMS value(max) | < 140 | | | V |
| Switched Current DC | < 500 | | | mA |
| Carry Current DC | < 0.5 | | | A |
| Contact Resistance | <200 | | | mΩ |
| Insulation Resistance | >$10^6$ | | | MΩ |
| Operating Temperature | -40 | - | 125 | °C |
| Operate Range | 10 | - | 40 | AT |

**Tip**
More details about Grove modules please refer to Grove System

## Platforms Supported

| Arduino | Raspberry Pi | BeagleBone | Wio | LinkIt ONE |
|---|---|---|---|---|
|  |  |  |  |  |

**Caution**

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

**Note**

If this is the first time you work with Arduino, we firmly recommend you to see Getting Started with Arduinobefore the start.
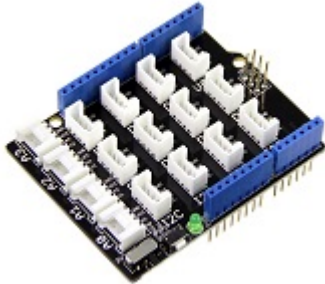
### Play With Arduino

*Demonstration*

The SIG pin of the module output LOW normally. When a magnet approaches the switch, the magnetic switch close and the SIG pin output HIGH.

*Hardware*

- **Step 1.** Prepare the below stuffs:

| Seeeduino V4.2 | Base Shield | Grove - Magnetic Switch |
|---|---|---|
|  |  |  |

- **Step 2.** Connect Grove - Magnetic Switch 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.
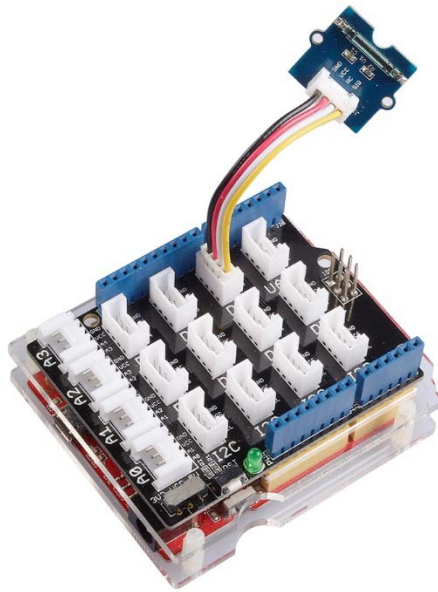
| Seeeduino | Grove-Magnetic_Switch |
|-----------|----------------------|
| 5V | Red |
| GND | Black |
| NC | White |
| D2 | Yellow |

*Software*

- **Step 1.** Copy the code into Arduino IDE and upload. If you do not know how to upload the code, please check how to upload code.

```
/*******************************************************************
*********/

/*macro definitions of magnetic pin and LED pin*/
#define MAGNECTIC_SWITCH 2
#define LED 13//the on board LED of the Arduino or Seeeduino

void setup()
```

```
{
    pinsInit();
}

void loop()
{
    if(isNearMagnet())//if the magnetic switch is near the magnet?
    {
        turnOnLED();
    }
    else
    {
        turnOffLED();
    }
}
void pinsInit()
{
    pinMode(MAGNECTIC_SWITCH, INPUT);
    pinMode(LED,OUTPUT);
}

/*If the magnetic switch is near the magnet, it will return ture, */
/*otherwise it will return false                                  */
boolean isNearMagnet()
{
    int sensorValue = digitalRead(MAGNECTIC_SWITCH);
    if(sensorValue == HIGH)//if the sensor value is HIGH?
    {
        return true;//yes,return ture
    }
    else
    {
        return false;//no,return false
    }
}
void turnOnLED()
{
    digitalWrite(LED,HIGH);
}
void turnOffLED()
{
    digitalWrite(LED,LOW);
}
```
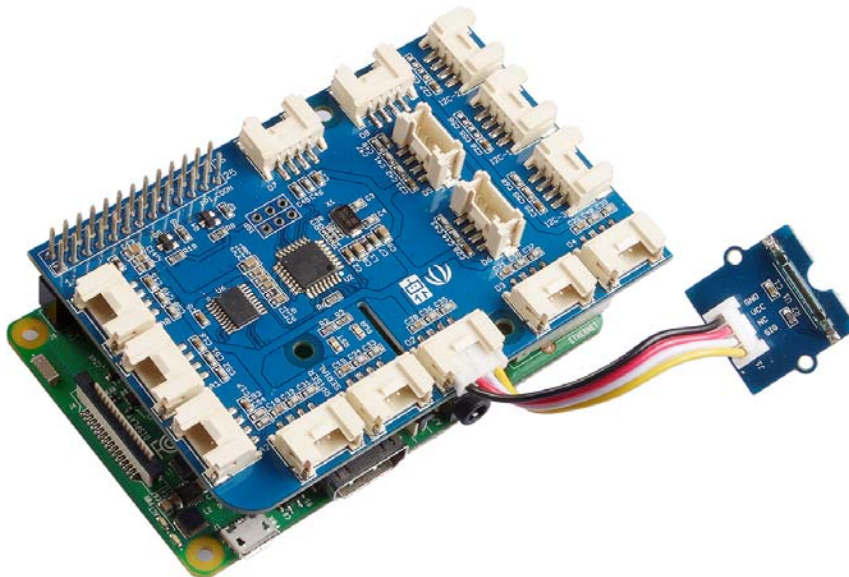
## Play With Raspberry Pi

*Hardware*

- **Step 1.** Prepare the below stuffs:

| Raspberry pi | GrovePi_Plus | Grove - Magnetic Switch |
|---|---|---|
|  |  |  |

- **Step 2.** Plug the GrovePi_Plus into Raspberry.
- **Step 3.** Connect Grove-Magnetic-Switch ranger to **D2** 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.** Navigate to the demos' directory:

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

- **Step 3.** To see the code (this demo has the same usage with tilt switch)

```
1 nano grovepi_tilt_switch.py    # "Ctrl+x" to exit #
```

```python
1 import time
2 import grovepi
3
4 # Connect the Grove Tilt Switch to digital port D2
5 # SIG,NC,VCC,GND
6 tilt_switch = 2
7
8 grovepi.pinMode(tilt_switch,"INPUT")
9
10 while True:
11     try:
12         print grovepi.digitalRead(tilt_switch)
13         time.sleep(.5)
14
15     except IOError:
16         print "Error"
```

- **Step 4.** Run the demo.

```
1 sudo python grovepi_tilt_switch.py
```

- **Step 5.** Result

Put a magnet upon the sensor, the SIG pin will output HIGH.

## Resources

- **[Eagle]** Grove-Magnetic Switch v0.9 Schematic

  https://raw.githubusercontent.com/SeeedDocument/Grove-Magnetic_Switch/master/res/Magnetic_Switch.zip


- **[Eagle]** Grove-Magnetic Switch v1.3 Schematic

  https://raw.githubusercontent.com/SeeedDocument/Grove-Magnetic_Switch/master/res/Grove-Magnetic_Switch_v1.3_Eagle_File.zip


- **[PDF]** Grove-Magnetic Switch v1.3 PDF File

  https://raw.githubusercontent.com/SeeedDocument/Grove-Magnetic_Switch/master/res/Grove-Magnetic_Switch_v1.3_PDF_File.pdf


- **[Datasheet]** CT10 Datasheet

  https://raw.githubusercontent.com/SeeedDocument/Grove-Magnetic_Switch/master/res/CT10.pdf


## Tech Support

Please submit any technical issue into our forum or drop mail to techsupport@seeed.cc.