



# Grove - Magnetic Switch User Manual

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Wiki: [http://www.seeedstudio.com/wiki/index.php?title=Twig -  
\\_Magnetic\\_Switch](http://www.seeedstudio.com/wiki/index.php?title=Twig_-_Magnetic_Switch)

Bazaar: [http://www.seeedstudio.com/depot/Grove-Magnetic-Switch-  
p-744.html](http://www.seeedstudio.com/depot/Grove-Magnetic-Switch-p-744.html)

## Document Revision History

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Revision	Date	Author	Description
1.0	Sep 22, 2015	Jiankai.li	Create file

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## 1. Introduction

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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.



## 2. Features

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

### 3. Application Ideas

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

## 4. Specification

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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 <sup>6</sup>			MΩ
Operating Temperature	-40	-	125	°C
Operate Range	10	-	40	AT



## 5. Usage

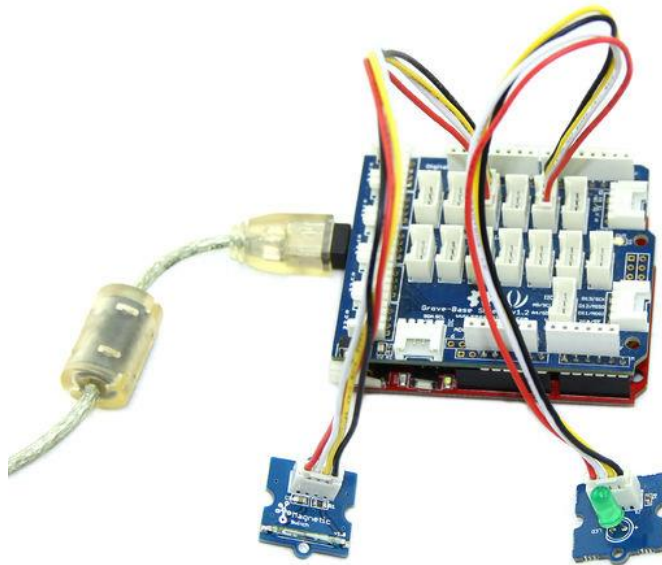
---

### 5.1 With Arduino

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.

The following sketch demonstrates a simple application of using the Magnetic switch to control the led. When you put a magnet that has enough magnetic power close to the module, the switch is closed .Then the SIG pin out put a high voltage. You can use this to control the led.

As the picture on the below indicates, the Magnetic switch is connected to digital port 9 of the [Grove - Basic Shield](#) and the LED is connected to digital port 13. When there is Magnetic approaches the switch, the SIG pin output a High voltage. Then the LED light. The hardware installation is as follows:



- Copy and paste code below to a new Arduino sketch.

```

/*****
*/

/*macro definitions of magnetic pin and LED pin*/
#define MAGNETIC_SWITCH 9
#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(MAGNETIC_SWITCH, INPUT);
    pinMode(LED, OUTPUT);
}

/*If the magnetic switch is near the magnet, it will return true, */
/*otherwise it will return false */
boolean isNearMagnet()
{
    int sensorValue = digitalRead(MAGNETIC_SWITCH);
    if(sensorValue == HIGH)//if the sensor value is HIGH?
    {
        return true;//yes, return true
    }
    else
    {
        return false;//no, return false
    }
}

void turnOnLED()
{
    digitalWrite(LED, HIGH);
}

void turnOffLED()
{
    digitalWrite(LED, LOW);
}

```

- Upload the code, Please click [here](#) if you do not know how to upload.
- Then the LED light when there is Magnetic approaches the switch. Have a try!

## 5.2 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 Magnet Switch to grovepi socket D3 by using a grove cable.

### 4. Navigate to the demos' directory:

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

- To see the code (this demo has the same usage with tilt switch)

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

# Connect the Grove Tilt Switch to digital port D3
# SIG, NC, VCC, GND
tilt_switch = 3

grovepi.pinMode(tilt_switch, "INPUT")

while True:
    try:
        print grovepi.digitalRead(tilt_switch)
        time.sleep(.5)

    except IOError:
        print "Error"
```

### 5. Run the demo.

```
sudo python grove_tilt_switch.py
```

### 6. Result

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

```
pi@raspberrypi: ~/Desktop/GrovePi/Software/Python
pi@raspberrypi ~/Desktop/GrovePi/Software/Python $ sudo python grove_tilt_switch.py
0
0
0
0
0
1
1
1
1
1
1
1
1
0
0
0
0
```

## 6. Resources

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- [Grove-Magnetic Switch v1.9 Eagle File](#)
- [CT10 datasheet](#)
- [Grove-Magnetic Switch v1.3 Eagle File](#)
- [Grove-Magnetic Switch v1.3 PDF File](#)

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