Grove - Magnetic Switch User Manual

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Wiki:http://www.seeedstudio.com/wiki/index.php?title=Twig_-_Magnetic_Switch

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

Document Revision History

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

Contents

Disclaimer

For physical injuries and possessions loss caused by those reasons which are not related to product quality, such as operating without following manual guide, natural disasters or force majeure, we take no responsibility for that.

Under the supervision of Seeed Technology Inc., this manual has been compiled and published which covered the latest product description and specification. The content of this manual is subject to change without notice.

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1. Introduction

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

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

3. Application Ideas

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

4. Specification

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	℃
Operate Range	10	-	40	AT

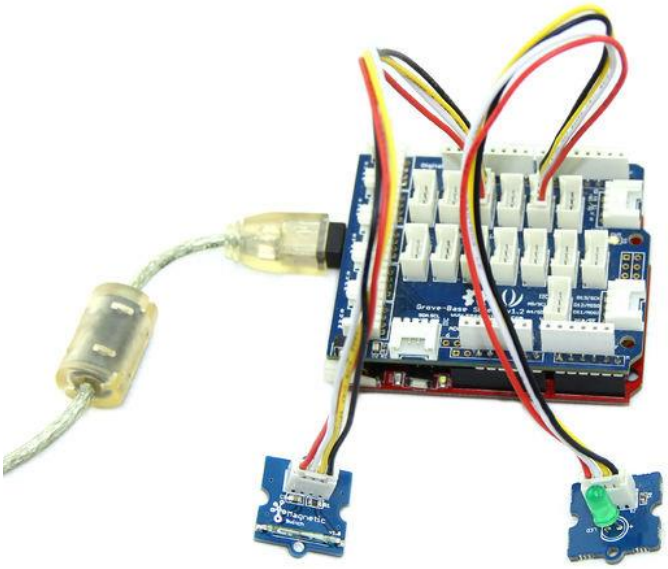
5. Usage

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 Shieldand 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 MAGNECTIC_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(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);
}
```

- 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
0
0
0

6. Resources

- Grove-Magnetic Switch v1.9 Eagle File
- CT10 datasheet
- Grove-Magnetic Switch v1.3 Eagle File
- Grove-Magnetic Switch v1.3 PDF File