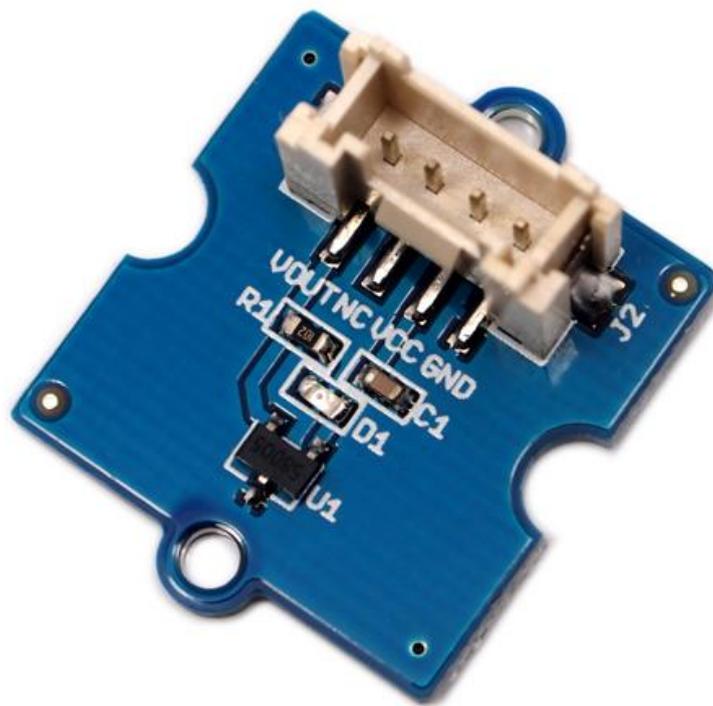# Grove - Hall Sensor

The Hall sensor is based on Hall Effect, which is the production of a voltage difference across an electrical conductor, transverse to an electric current in the conductor and a magnetic field perpendicular to the current. There is a continuous-time switch on this Grove. The output of these devices switches low (turns on) when a magnetic field (south polarity) perpendicular to the Hall sensor exceeds the

operate point threshold BOP, and it switches high (turn off) when the magnetic field disappears. The twig can be used to measure RPM.

Get One Now 🛒

[https://www.seeedstudio.com/depot/grove-hall-sensor-p-965.html]

Version Tracker

Revision	Descriptions	Release
Grove - Hall Sensor v0.9b	Initial public release	3,Oct,2011

Features

- Grove Compatible Interface

- 400ns transition period for rise and fall.

- Continuous-time hall effect sensor

- Reverse battery protection

> 🔥 **Tip**
> More details about Grove modules please refer to Grove System [https://wiki.seeedstudio.com/Grove_System/]

Specifications

Item	Min	Typical	Max	Unit
Supply Voltage	3.8	5.0	24	V
Supply Current	4.1	-	24	mA
Operating Temperature	-40	-	85	ºC

Platforms Supported

Arduino	Raspberry Pi			

> ⚠ **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.

Application Ideas

- RPM meter.

- Simple dc motor.

Getting Started

> ✏️ **Note**
> If this is the first time you work with Arduino, we firmly recommend you to see Getting Started with Arduino [https://wiki.seeedstudio.com/Getting_Started_with_Arduino/] before the start.

Play With Arduino

Demonstration

The Hall Sensor is used by utilizing the external interrupts available on the arduino/seeeduino. In this example we are using interrupt 0, found on digital pin 2. For other interrupts, see the attachInterrupt() [https://arduino.cc/en/Reference/AttachInterrupt].
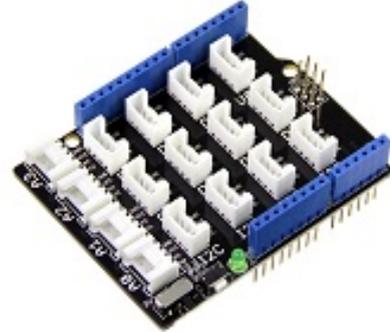
Hardware

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

Seeeduino V4.2	Base Shield

Get One Now
[https://www.seeedstudio.com/Seeeduino-V4.2-p-2517.html]

Get One Now
[https://www.seeedstudio.com/Base Shield-V2-p-1378.html]

- **Step 2.** Connect Grove - Hall Sensor 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 - Hall Sensor to Seeeduino as below.

Seeeduino	Grove - Hall Sensor
5V	Red
GND	Black
Not Conencted	White
D2	Yellow

Software

- **Step 1.** Download the Hall Sensor Code [https://files.seeedstudio.com/wiki/Grove-Hall_Sensor/res/Grove-Hall_Sensor_Demo_Code.zip]

- **Step 2.** Open one of two code. For example Demo **MagnetControlLED**

- **Step 3.** Copy the code into Arduino IDE and upload. If you do not know how to upload the code, please check how to upload code [https://wiki.seeedstudio.com/Upload_Code/].

```
 1  /**********************************************************
 2  //  Function: When a magnet whose south pole is facing up
 3  //            the onboard sensor, the LED will be turned
 4  //            LED will be turned off.
 5  //  Hardware: Grove - Hall Sensor, Grove - LED
 6  //  Arduino IDE: Arduino-1.0
 7  //  Author:  FrankieChu
 8  //  Date:    Jan 20,2013
 9  //  Version: v1.0
10  //  by www.seeedstudio.com
11  //
12  //  This library is free software; you can redistribute
```

```
13   //   modify it under the terms of the GNU Lesser General
14   //   License as published by the Free Software Foundation,
15   //   version 2.1 of the License, or (at your option) any
16   //
17   //   This library is distributed in the hope that it will
18   //   but WITHOUT ANY WARRANTY; without even the implied w
19   //   MERCHANTABILITY or FITNESS FOR A PARTICULAR PURPOSE.
20   //   Lesser General Public License for more details.
21   //
22   //   You should have received a copy of the GNU Lesser Ge
23   //   License along with this library; if not, write to th
24   //   Foundation, Inc., 51 Franklin St, Fifth Floor, Bosto
25   //
26   /*macro definitions of magnetic pin and LED pin*/
27   #define HALL_SENSOR 2
28   #define LED 4//the Grove - LED is connected to D4 of Ard
29
30   void setup()
31   {
32       pinsInit();
33   }
34
35   void loop()
36   {
37       if(isNearMagnet())//if the hall sensor is near the m
38       {
39           turnOnLED();
40       }
41       else
42       {
43           turnOffLED();
44       }
45   }
46   void pinsInit()
47   {
48       pinMode(HALL_SENSOR, INPUT);
49       pinMode(LED,OUTPUT);
50   }
51
52   /*If the hall sensor is near the magnet whose south pole
53   /*it will return ture, otherwise it will return false.
```

```
54  boolean isNearMagnet()
55  {
56      int sensorValue = digitalRead(HALL_SENSOR);
57      if(sensorValue == LOW)//if the sensor value is LOW?
58      {
59          return true;//yes,return ture
60      }
61      else
62      {
63          return false;//no,return false
64      }
65  }
66  void turnOnLED()
67  {
68      digitalWrite(LED,HIGH);
69  }
70  void turnOffLED()
71  {
72      digitalWrite(LED,LOW);
73  }
```

- **Step 4.** When a magnet whose south pole is facing up is approaching to the onboard sensor, the LED will be turned on. Otherwise, the LED will be turned off.

Play with Codecraft

Hardware

Step 1. Connect a Grove - Hall Sensor to port D2, and connect a Grove - Red LED to port D4 of a Base Shield.

Step 2. Plug the Base Shield to your Seeeduino/Arduino.

Step 3. Link Seeeduino/Arduino to your PC via an USB cable.

Software

Step 1. Open Codecraft [https://ide.chmakered.com/], add Arduino support, and drag a main procedure to working area.

> ✏️ **Note**
> If this is your first time using Codecraft, see also Guide for Codecraft using Arduino
> [https://wiki.seeedstudio.com/Guide_for_Codecraft_using_Arduino/].

Step 2. Drag blocks as picture below or open the cdc file which can be downloaded at the end of this page.
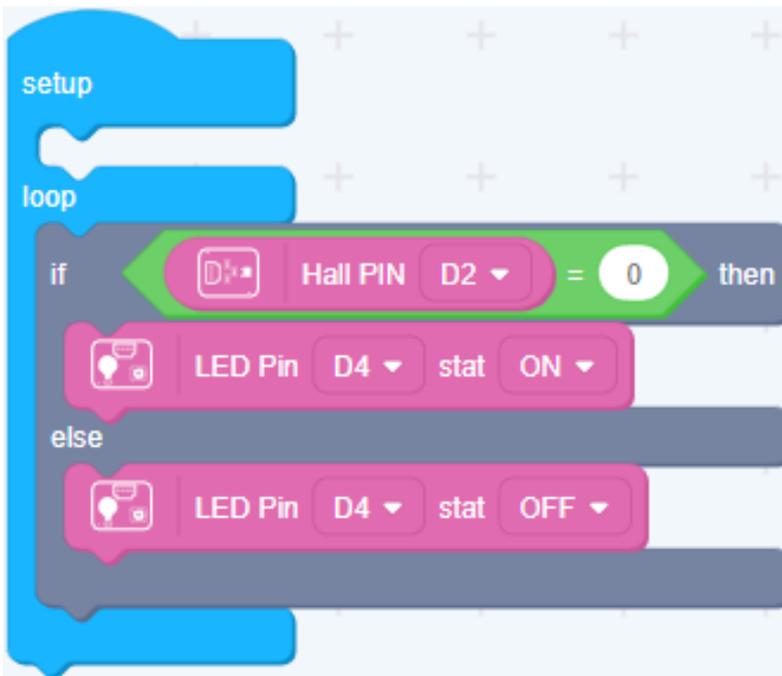
Upload the program to your Arduino/Seeeduino.

> ✓ **Success**
> When the code finishes uploaded, the LED will goes on when Hall Sensor detects changes in the magnetic field.

Schematic Online Viewer

Resources

- **[Eagle]** Grove-Hall Sensor Schematic [https://files.seeedstudio.com/wiki/Grove-Hall_Sensor/res/Twig_Hall_Sensor_v0.9b.zip]

- **[Demo]** Hall Sensor Demo Code [https://files.seeedstudio.com/wiki/Grove-Hall_Sensor/res/Grove-Hall_Sensor_Demo_Code.zip]

- **[Datasheet]** A1101 datasheet
  [http://www.allegromicro.com/en/Products/Part_Numbers/1101/1101.pdf]

- **[Codecraft]** CDC File [https://files.seeedstudio.com/wiki/Grove-Hall_Sensor/res/Grove_Hall_Sensor_CDC_File.zip]

Tech Support

Please submit any technical issue into our forum [https://forum.seeedstudio.com/].

[https://www.seeedstudio.com/act-4.html?
utm_source=wiki&utm_medium=wikibanner&utm_campaign=newproducts]