

# Gravity: Digital Shake Sensor

SKU: SEN0289

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## Introduction

Do you want to switch lights by just shaking your hand? However, you may don't want to use a complicated and costly triple axis accelerometer. This digital shake sensor is sure to meet your needs.

The digital shake sensor is to detect hand shaking which only sensitive to unidirectional hand movements. The spring-type vibration switch is used to output a low-level pulse when the user shakes once in the specified direction and the on-board indicator flashes at the same time. Thanks to the unidirectional sensitivity of the vibration switch and the corresponding filter circuit, it has strong anti-shock interference capability to prevent false triggering. Simple and easy, switch controls are all in just a single shake.

# Features

- Unidirection sensitive, strong anti-shock interference, preventing false triggering
- Compatible with 3.3V/5V controller
- Compact design, easy to install

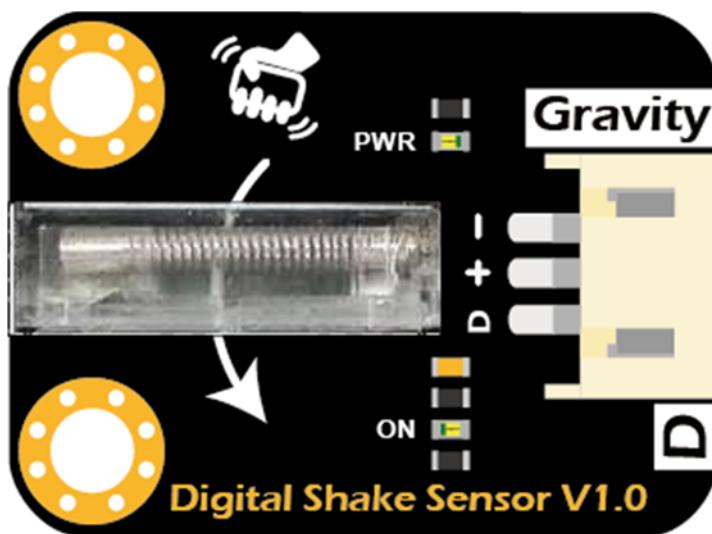
# Applications

- Shaking Light Stick
- Shake Switch

# Specifications

- Input Voltage (VCC): 3.3V~5.0V
- Switch Life Span: Over 200,000 times
- Interface: Gravity 3P Digital
- Dimension: 30.0mm\*22.0mm

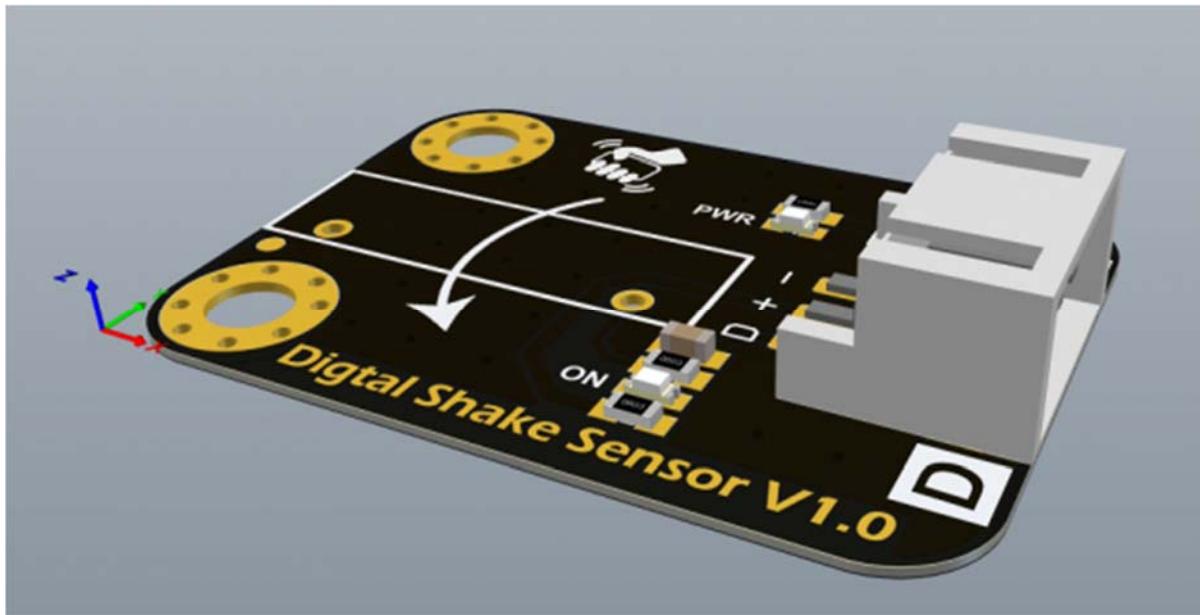
# Board Overview



Digital Shake  
Sensor

Label	Name	Description
+	VCC	Power positive (3.3~5.0V)
-	GND	Power ground
D	Digital	Digital output (high-level when stationary, low-level pulse when shaken)
PWR	Power	Power indicator (red), turned on when power up
ON	ON	Shake triggered indicator (blue)

## How to Shake the Sensor



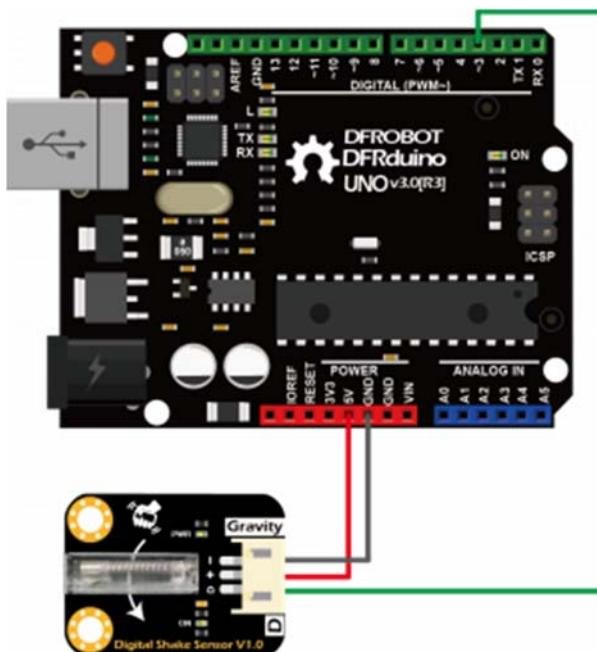
The vibration switch used by the sensor is unidirectional sensitivity. As shown in the above figure, the user can hold the module just like the logo on the module, and shake it in the direction of the arrow indicated on-board (from +Y to Y-). This will generate an effective low-level interrupt pulse on the "D" pin and a bright flash on the indicator ON. Shakes or vibrations in other directions like the X or Z do not produce an effective interrupt pulse.

# Arduino Tutorial

## Requirements

- **Hardware**
  - DFRduino UNO R3 (or similar) x 1
  - DFRobot Gravity: Digital Shake Sensor x 1
  - Gravity 3P digital wire (or Dupont wires) x 1
- 
- **Software**
  - Arduino IDE (V1.0.x or V1.8.x), [Click to Download Arduino IDE from Arduino®](#)

## Connection Diagram



## Example Codes

```
#define LED_PIN          13
#define DIGITAL_INPUT_PIN 3           //Connect the sensor to digital
Pin 3 which is Interrupts 1.

unsigned char stateFlag = 0;
unsigned long timepoint = 0;

void setup()
```

```

{
    pinMode(LED_PIN, OUTPUT);

    // Set to input mode with internal pull-up.
    // Otherwise, it will fail to generate interupts under 3.3V power supply.
    pinMode(DIGITAL_INPUT_PIN, INPUT_PULLUP);

    attachInterrupt(1, toggleLED, FALLING);      // Trigger LED toggle function
when the falling edge is detected

    timepoint = millis();
}

void loop()
{
    // toggle onboard LED

    if (stateFlag != 0){
        digitalWrite(LED_PIN, HIGH);
    }
    else {
        digitalWrite(LED_PIN, LOW);
    }
}

//Interrupt service routinue

void toggleLED()
{
    // The hardware has done some filter.

    // To further improve stability, here add a 50ms for debouncing.

    // This will not block the main function.

    if (millis() - timepoint > 50U){

        timepoint = millis();
        stateFlag = (stateFlag + 1) % 2;
    }
}

```

# Results

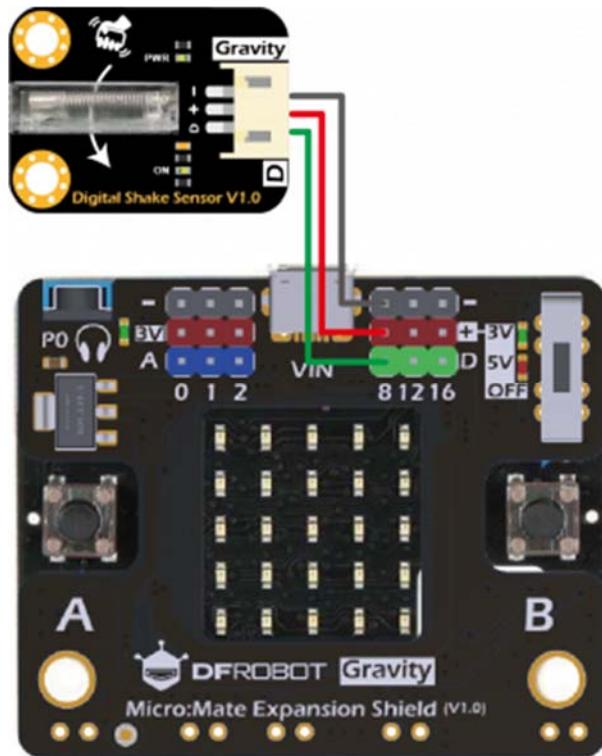
- In the direction indicated by the arrow on-board, every time the module is shaken, the ON indicator on the sensor will flash once. The indicator L on the Arduino UNO will be toggled once.

# Micro:bit Tutorial

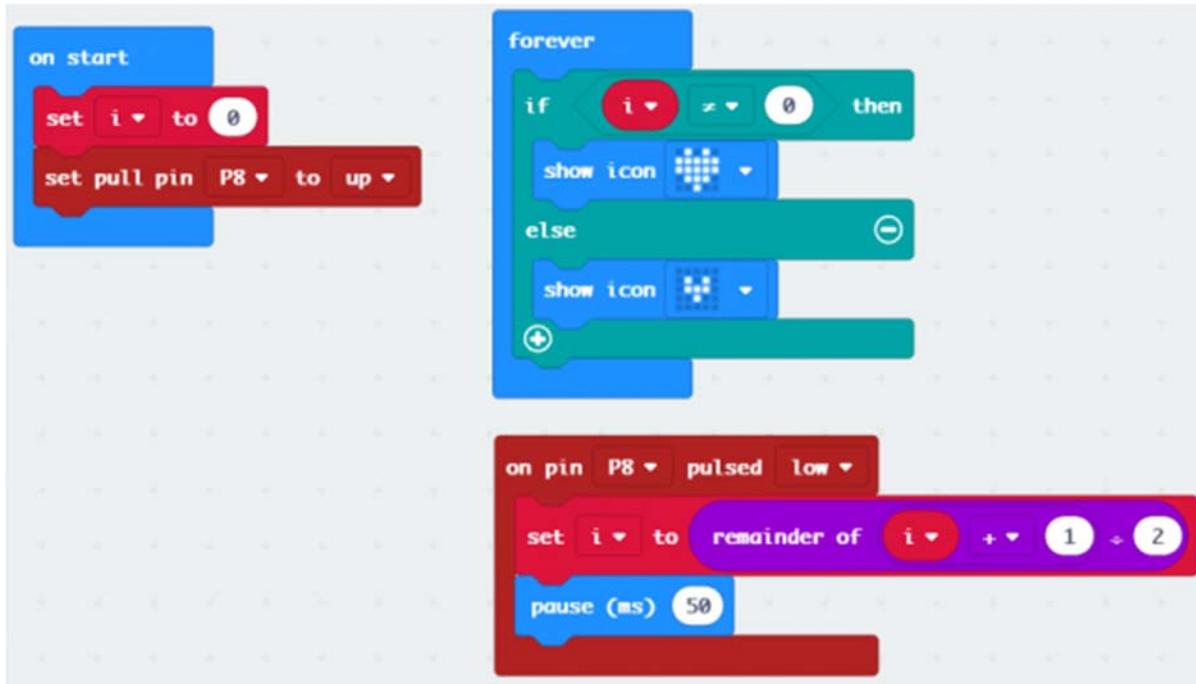
## Requirements

- **Hardware**
  - Micro:bit x 1
  - Micro:mate x 1
  - DFRobot Gravity: Digital Shake Sensor x 1
  - Gravity 3P digital wire (or Dupont wires) x 1
- **Software**
  - Microsoft Makecode

## Connection Diagram



## Example Codes



## Results

- Shake the module in the direction indicated on-board several times with force. The dot matrix LED displays the heartbeat pattern.