RPI-1031 4-Direction Sensor

Technical Manual Rev 1r0

The RPI-1031 4-Direction Sensor is based on Rohm RPI-1031 sensor. Detects x-y tilt or motion in 4 quandrant direction. Two-bit logic outputs latches and indicates the most recent motion direction.

Applications:

- DSC (Digital Steal camera)
- DVC (Digital video camera)
- Digital handy phone, Fan herater, Projector

Features:

- Surface Mount type
- Optical sensor
- 4 Pirection detector

General Specifications:

Input supply voltage: 5V
Model: RPI-1031
Type: Magnetic sensor
Output: Digital
Usage: Angle sensor

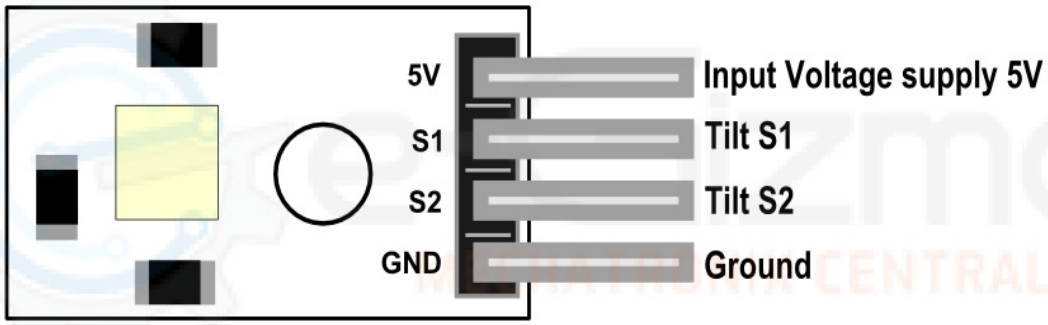
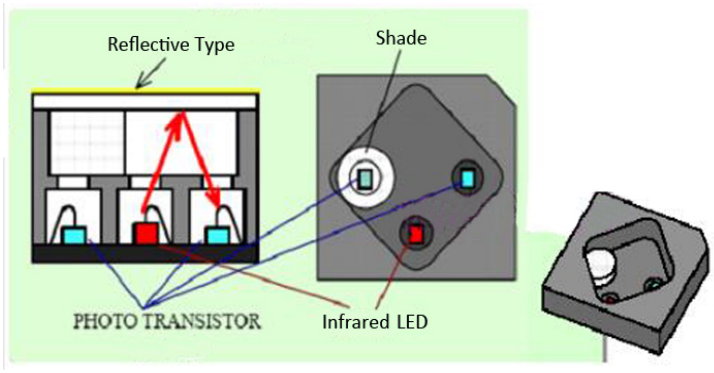


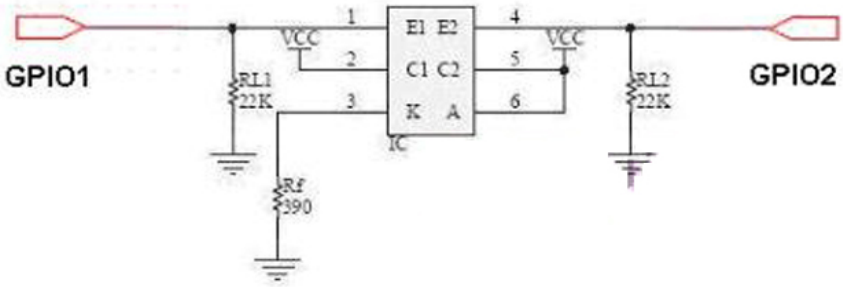
Figure 1: RPI-1031 4 Direction

Operating Principle:

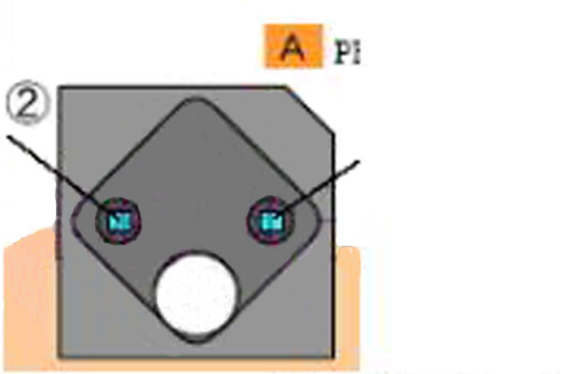
1. Based on optics principles,its interior has LED for 1pc,photosensitive receiving triode for 2pcs;and the other side has one cylindrical shade;just as the picture shows:



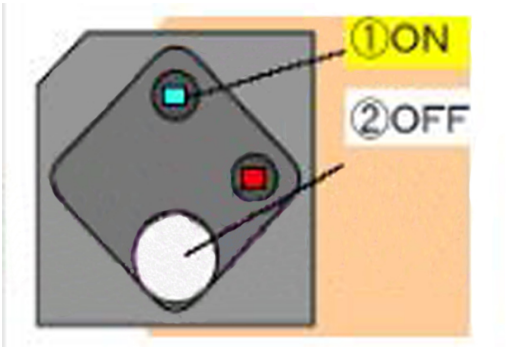
Circuit Diagram:



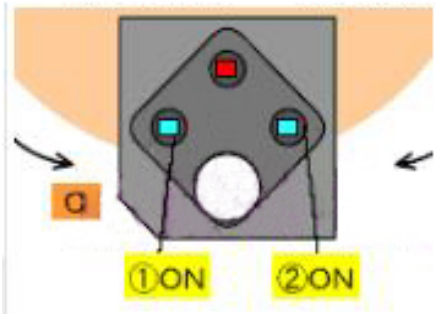
2. By cylindrical shade to keep out the LED,and photosensitive receiving tube is for detecting RPI-1031 current state



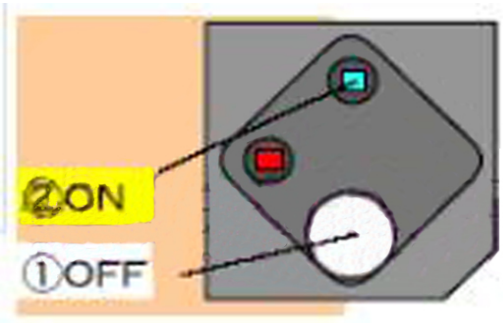
3.When RPI-1031 rotates to the state shown as below,LED is shadowed by the shade;and two photosensitive receiving triodes cannot receive the light;they will be in off state,output low level;two GPIO ports both output low level



4.When RPI-1031 rotates to the state shown as below,one of the photosensitive triode was shadowed,the light emitted by LED only can be received by the other one;that means above photosensitive triode is on,and photosensitive triode under side is off;then two GPIO ports output respectively output high level and low level



5.When RPI-1031 rotates to the state shown as below,the shade does not shadow;the diode will shine,two photosensitive triodes can receive the light;then all of them will be on,both of two GPIO ports output high level



6.When RPI-1031 rotates to the state shown as below,this state is adverse to description 4;two GPIO ports output level will be intercahnged

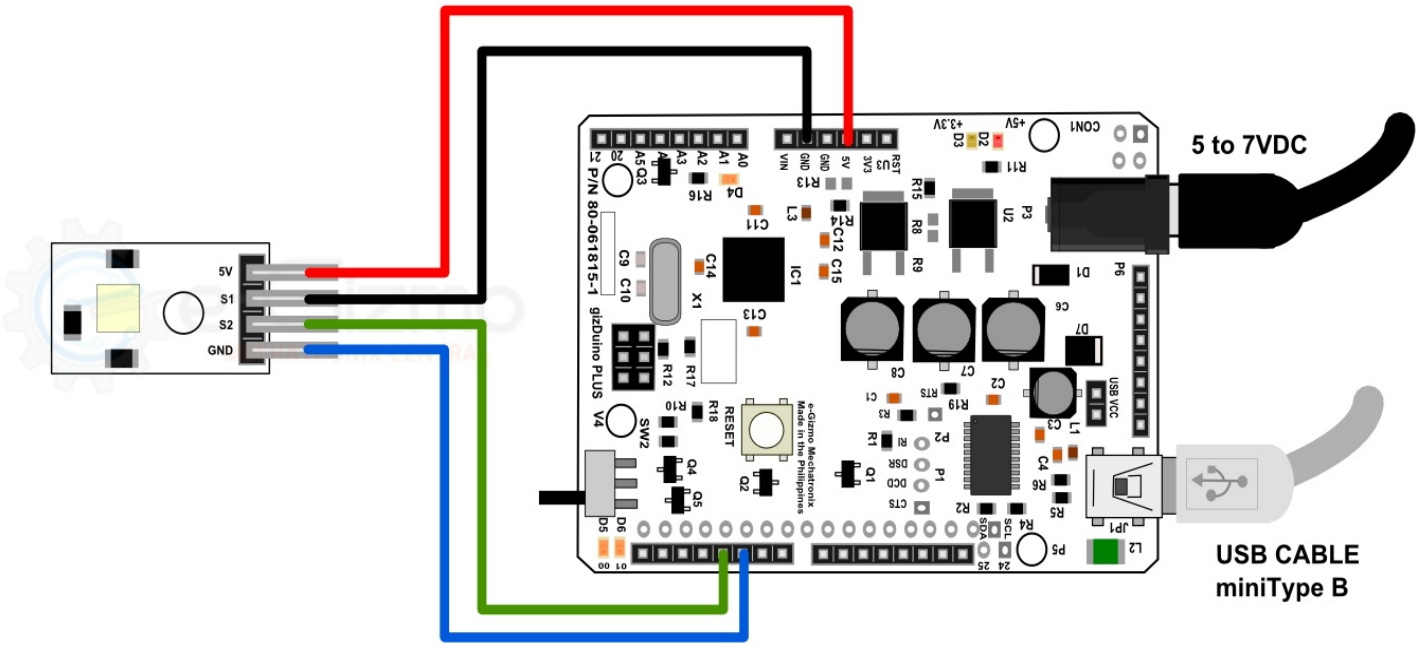


Figure 2: Sample connections.

```
/*
  e-Gizmo RPI-1031 Angle sensor 4 Direction sensor

  This is a sample sketch for Tilt direction sensor
  to display the sensor output positions.

  For the RPI-1031 - http://www.sparkfun.com/products/10621

  Modified by e-Gizmo Mechatronix Central
  http://www.e-gizmo.com
  July 18,2017

*/

#define TILT_S1 4
#define TILT_S2 5
#define LED_TOP 8
#define LED_RIGHT 9
#define LED_BOTTOM 10
#define LED_LEFT 11

void setup(){
  Serial.begin(9600);
  pinMode(TILT_S1, INPUT);
  pinMode(TILT_S2, INPUT);
  pinMode(LED_TOP, OUTPUT);
  pinMode(LED_RIGHT, OUTPUT);
  pinMode(LED_BOTTOM, OUTPUT);
  pinMode(LED_LEFT, OUTPUT);
}

void loop(){
  int position = GET_TILT_POSITION();
  Serial.println(position);
  //TOP
  if(position == 0)
  {
    digitalWrite(LED_TOP, HIGH);
    digitalWrite(LED_RIGHT, LOW);
    digitalWrite(LED_BOTTOM, LOW);
    digitalWrite(LED_LEFT, LOW);
  }
  //RIGHT
  if(position == 2)
  {
    digitalWrite(LED_TOP, LOW);
    digitalWrite(LED_RIGHT, HIGH);
    digitalWrite(LED_BOTTOM, LOW);
    digitalWrite(LED_LEFT, LOW);
```

```
  }
  //LEFT
   if(position == 1)
  {
    digitalWrite(LED_TOP, LOW);
    digitalWrite(LED_RIGHT, LOW);
    digitalWrite(LED_BOTTOM, LOW);
    digitalWrite(LED_LEFT, HIGH);
  }
  //BOTTOM
   if(position == 3)
  {
    digitalWrite(LED_TOP, LOW);
    digitalWrite(LED_RIGHT, LOW);
    digitalWrite(LED_BOTTOM, HIGH);
    digitalWrite(LED_LEFT, LOW);
  }
  delay(200); //DELAY
}

int GET_TILT_POSITION(){
  int S1 = digitalRead(TILT_S1);
  int S2 = digitalRead(TILT_S2);
  return (S1 << 1) | S2; //BITWISE MATH
}
```

Figure 3: Serial print output from pH sensor.