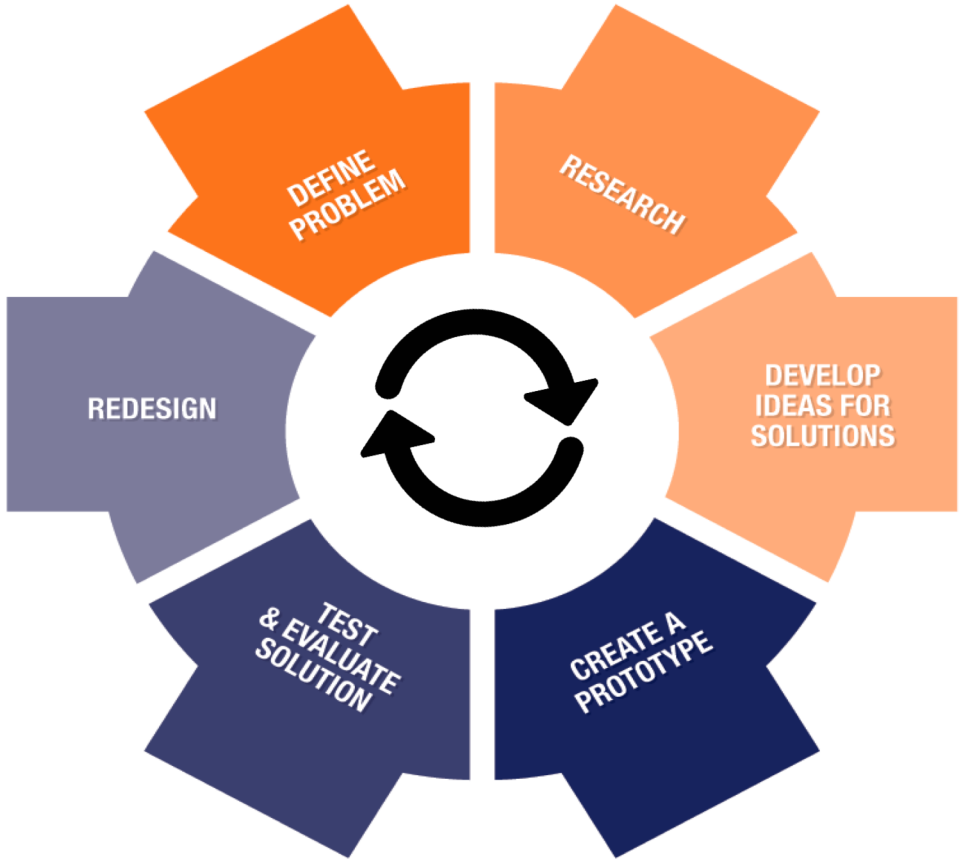


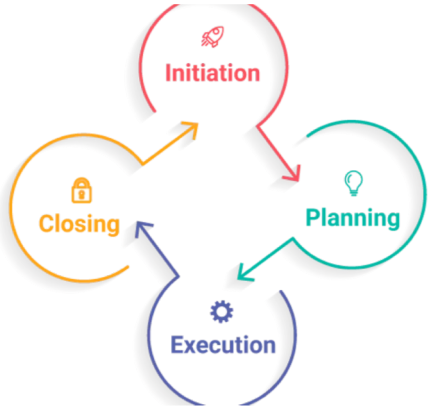
Robotics

Project Roll Out

“Setting Expectation”

Version 1.0

Project Life Cycle



1.Formation of teams

2.Sensor Selection

3.Prepare Write up

4.Project Confirmation

5.Material Hand-over

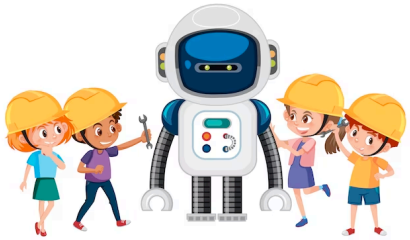
6.Projection Execution

7.Submission

31st Jan 2024

8.Evaluation

9.R&R



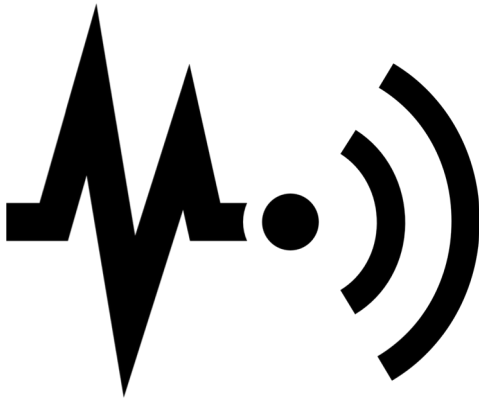
STAGE1

TEAM UP

- Choose your Team Members
- Consists of **four** students in a group.
- Changes to the team cannot be requested while the project is being executed.

STAGE 2

Sensor



- For the project, each team must choose one or more sensors depending on the project requirement.
- Research, Read, Consult, Discuss with your team before confirming a Sensor for project.

STAGE 3

Prepare a Write Up

After choosing the sensor, a write-up in the format of an A4 sheet must be submitted. It should include the following details along with team member Names, Roll numbers:

- *About the Sensor*
- *Application of the Sensor*
- *Pin Out*
- *Limitation of the Sensor*

STAGE 4

Project Confirmation

- At this point, you should have a good understanding of the sensor that you and your team have selected, as well as its applications, limitations, etc.
- Select one real-world issue that your group would like to solve as a project, based on the Sensor's application.
- With your ATL teacher, confirm your team's interest in the project.

STAGE 5

Project Material - Handover

After the project has been confirmed, the ATL teacher will provide all the tools and equipment needed for it, as well as assistance with integration and troubleshooting. *The offered equipment must only be used responsibly*.

We do not approve of any damages; Kindly handle them carefully.

- Utilize the minimal specifications of the device.
- The completed project needs to be submitted in before the ***January 31, 2024***.
- Prototypes that are fully functional are acceptable for the show.

STAGE 6

Project Execution

- Changes to the Team, Sensor, or Project are strictly not allowed during project execution.
- Students are advised to handle the project equipment with the utmost care. Unintentional harm or careless behavior could cause a submission delay, which could prevent the project from being exhibited.

SAFETY RULES

1.Always act responsibly when engaging in STEM-related activities at home or classroom.

2.Pranks, practical jokes, and horseplay are not acceptable in the Lab.

3.Follow all written and verbal instructions carefully. Ask your teacher questions if you don't understand the instructions.

4.Perform only authorized and approved experiments.

5.Never place any instrument or materials in your mouth.

6.Wash your hands before taking a break for a snack or meal.

7.Handle all instruments with care and respect.

8.Don't power up MCU / MPU without checking with your ATL teacher.

STAGE 7

Project Submission

- ✓ Only completed projects are taken into consideration for show.
- ✓ Projects sent in by the deadline or earlier are taken into account.
- ✓ It is strictly forbidden for projects to be completed partially.
- ✓ There will be no grace period for the project submission deadline.

Project Evaluation

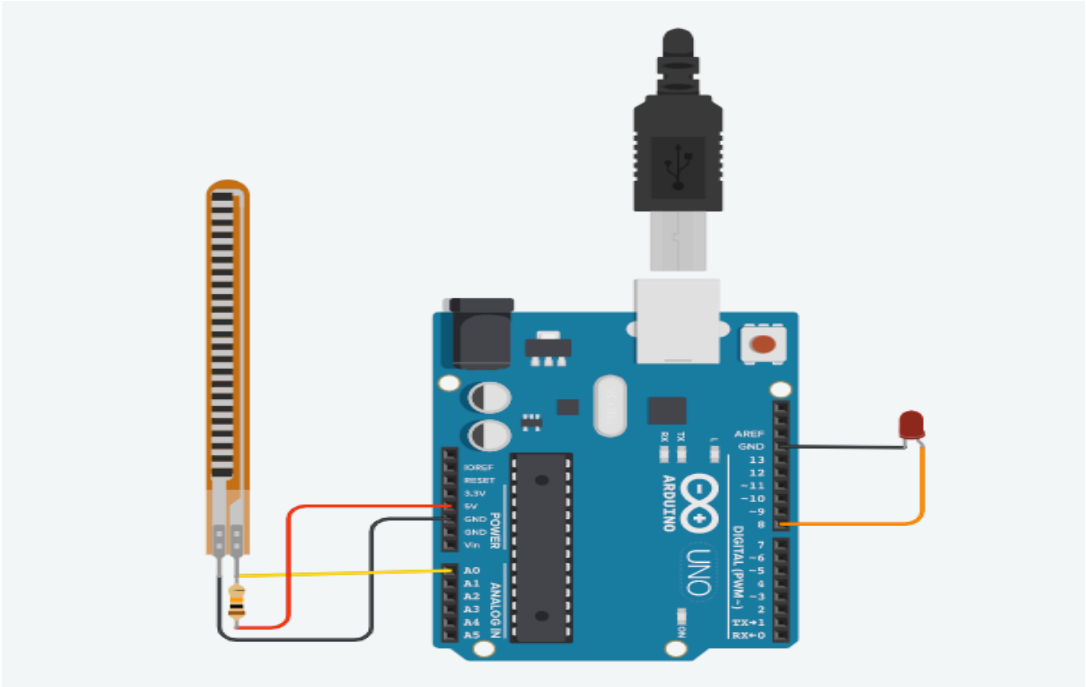
- The project will be evaluated by an external subject matter expert.

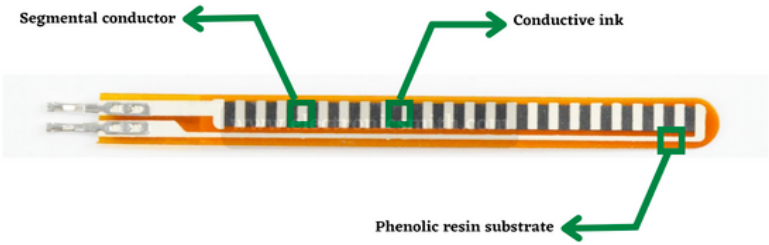
Sensors

A Quick Glance

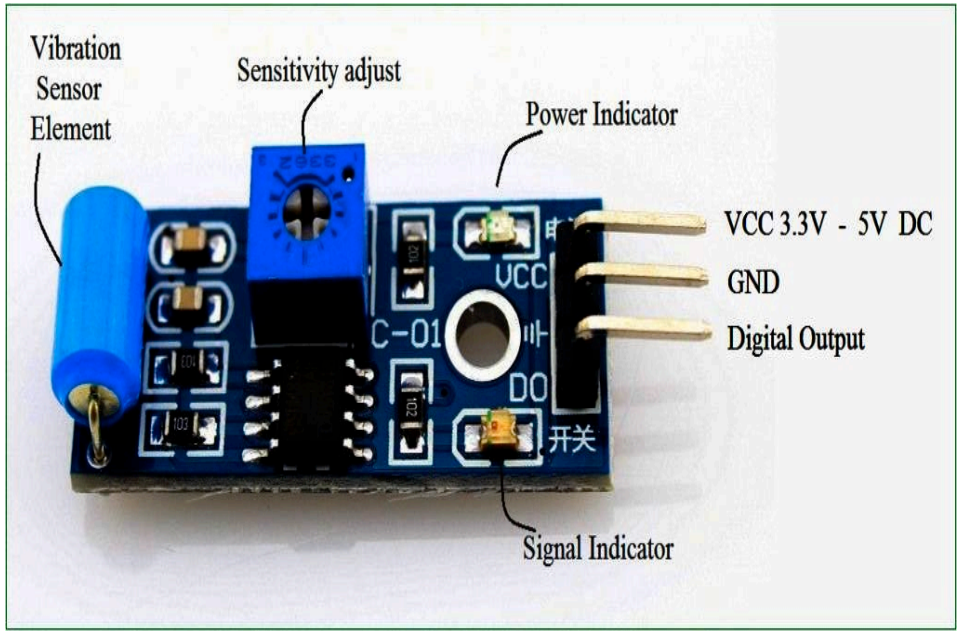
Flex Sensor

A Flex Sensor or sometimes called as Bend Sensor is a device that measures the amount of bend or angular deflection





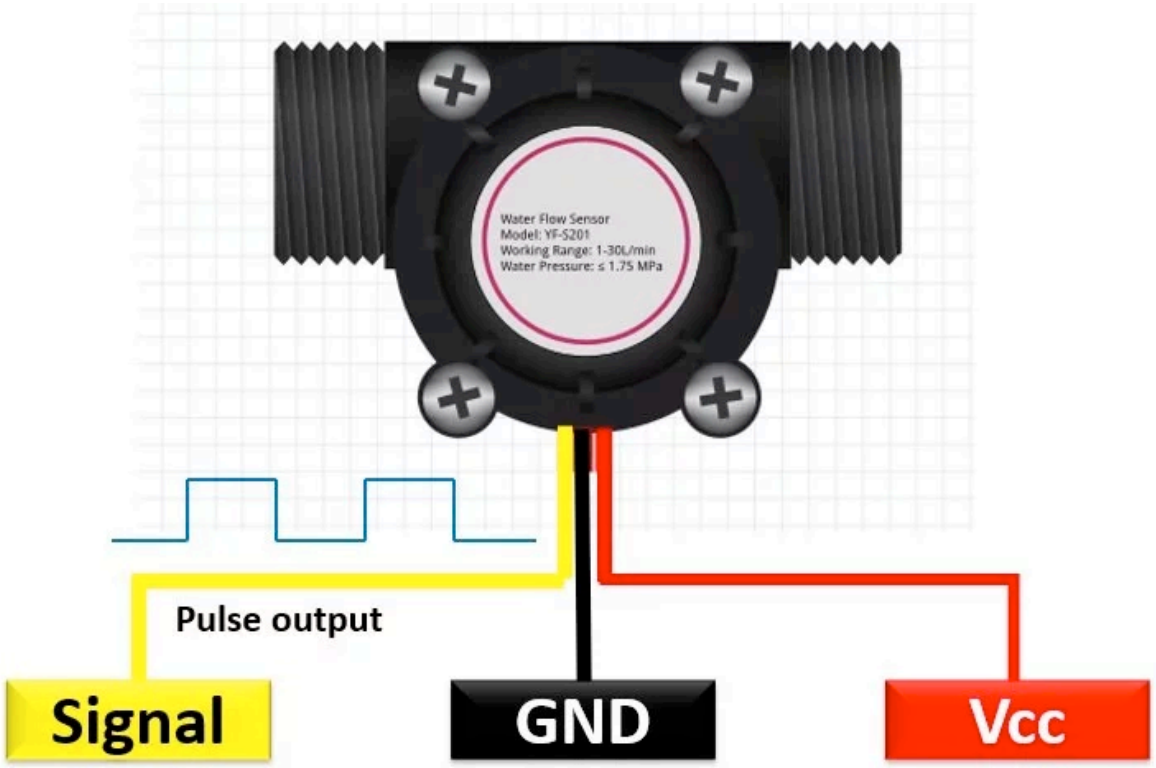
Vibration Sensor



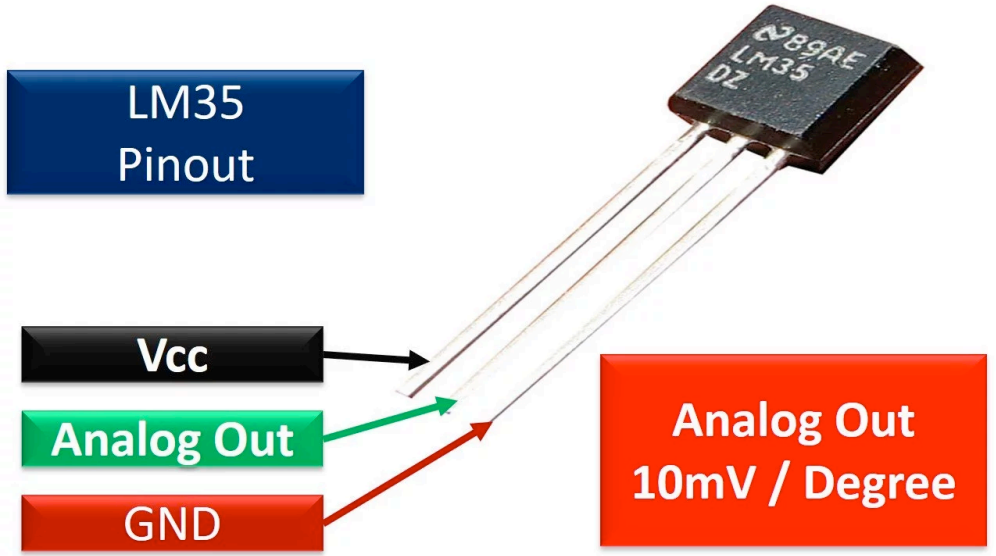
A vibration sensor is a measuring device. It senses the vibration or to-and-fro movement of any equipment or system at the location where it is applied.

Water Flow Sensor

It can measure the flow of fluids milk, petrol, diesel, and other industrial fluids.



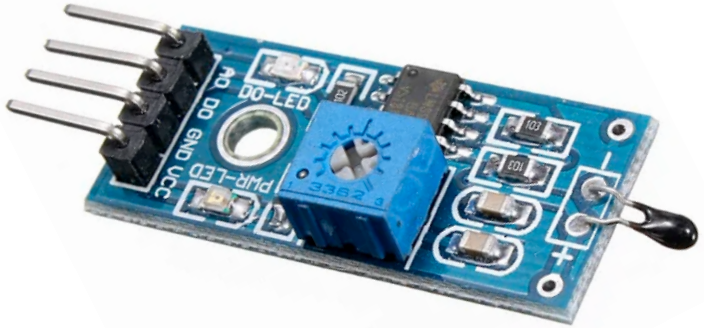
LM35 Sensor

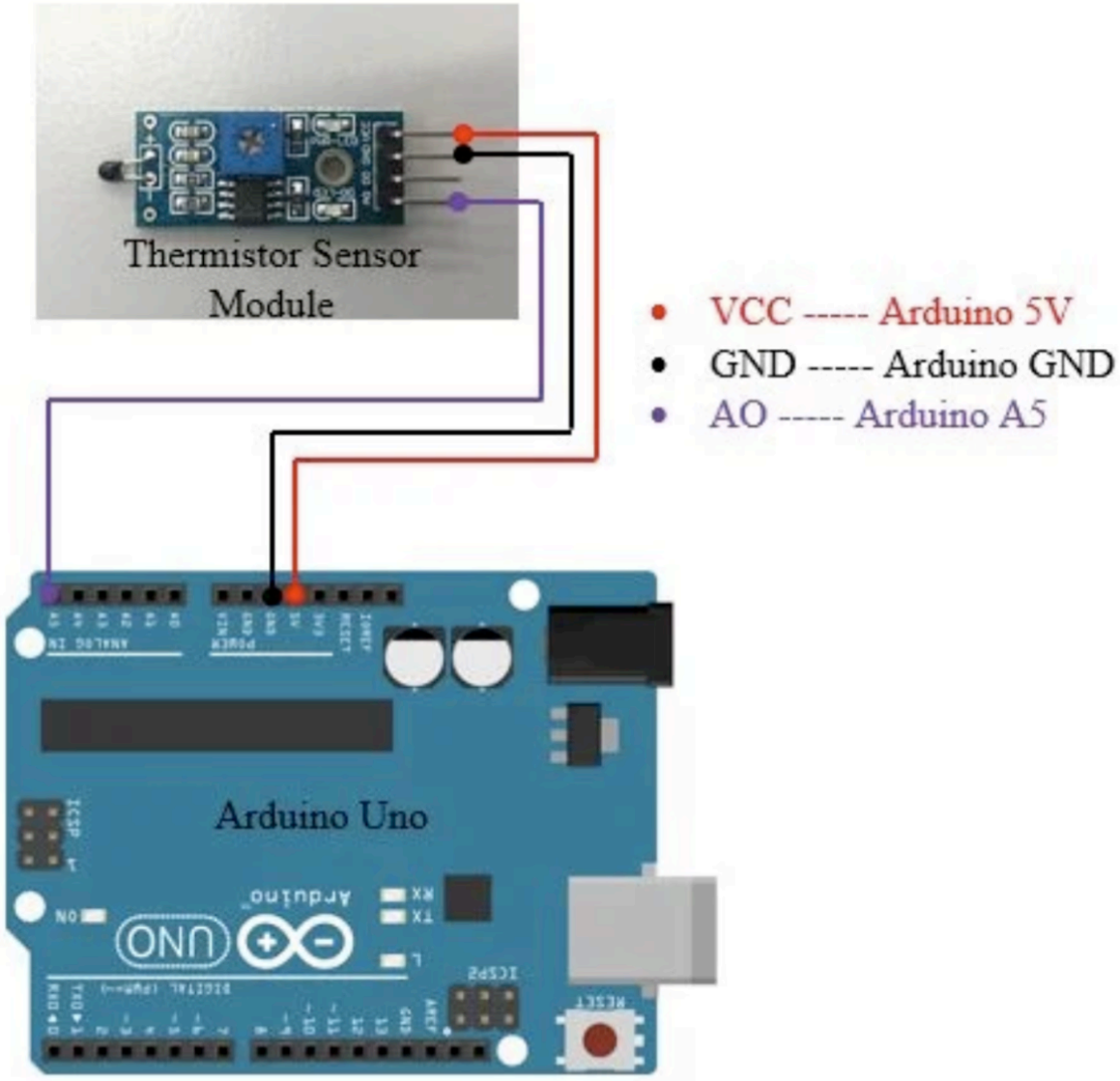


- LM35 is a temperature sensor
- Measuring the temperature of a particular environment
- Measuring battery temperature
- Providing battery protection from overheating

Thermistor Sensor Module

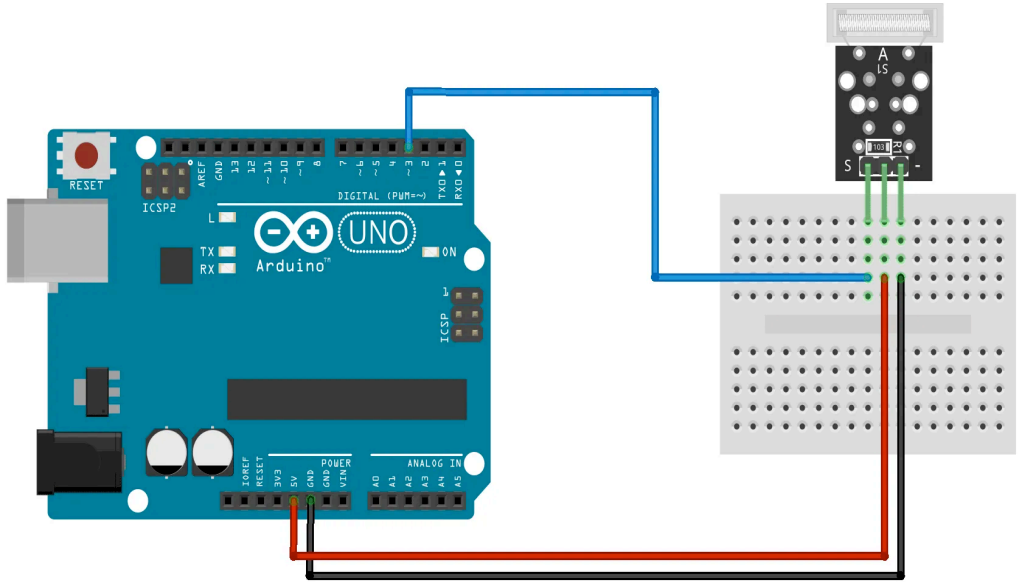
Temperature sensing device that utilizes the principle of thermistor resistance to measure and control temperature.

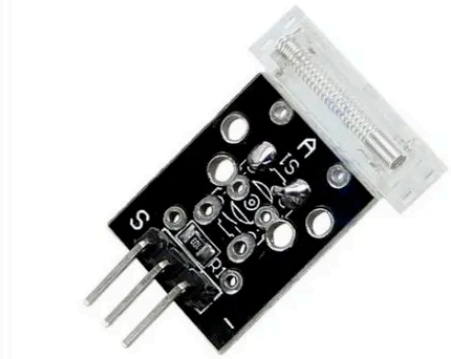




KY-031 Knock Sensor Module

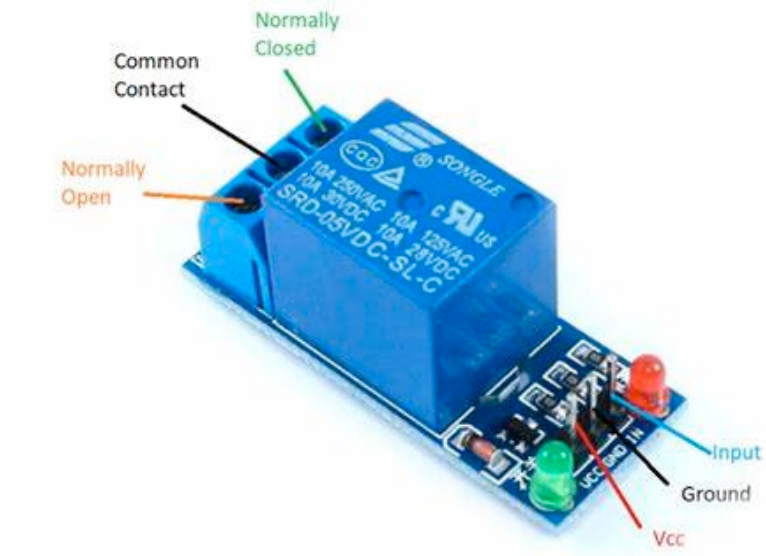
Is a vibration sensor that sends a signal when a knock or tap is detected.

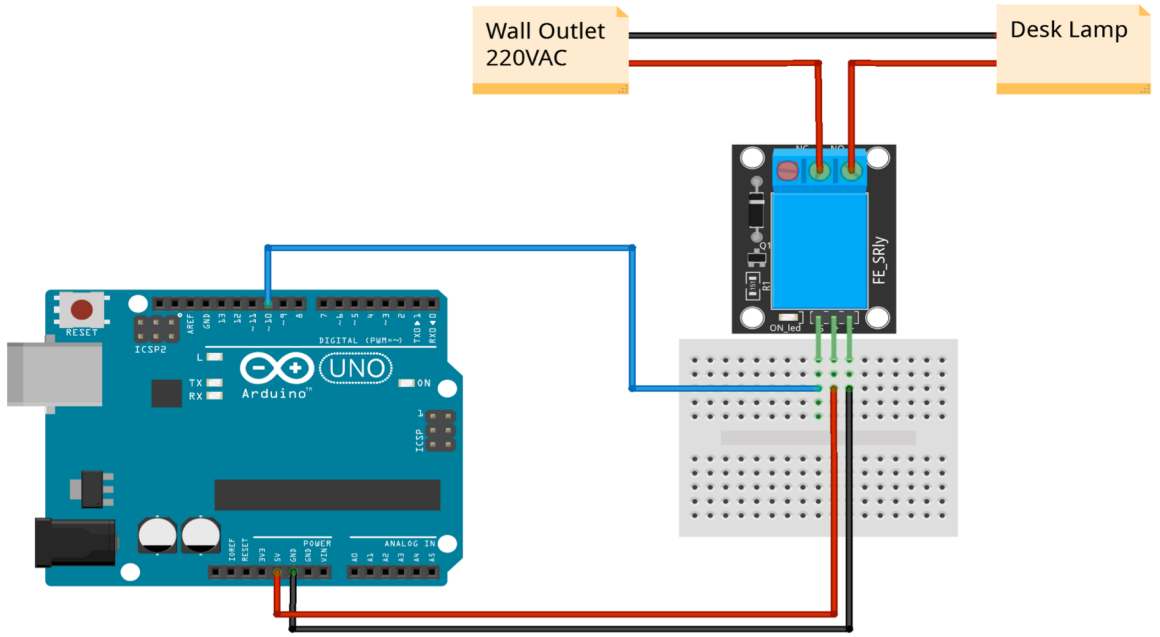




5v Relay module

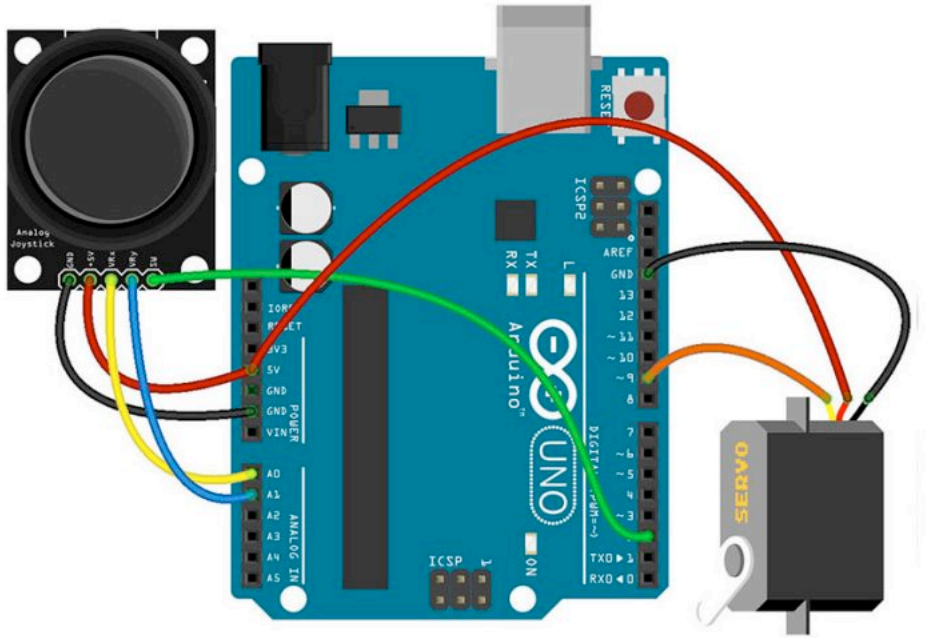
A **5V relay module** is an electronic component that allows low-voltage electrical signals to control a higher voltage circuit.





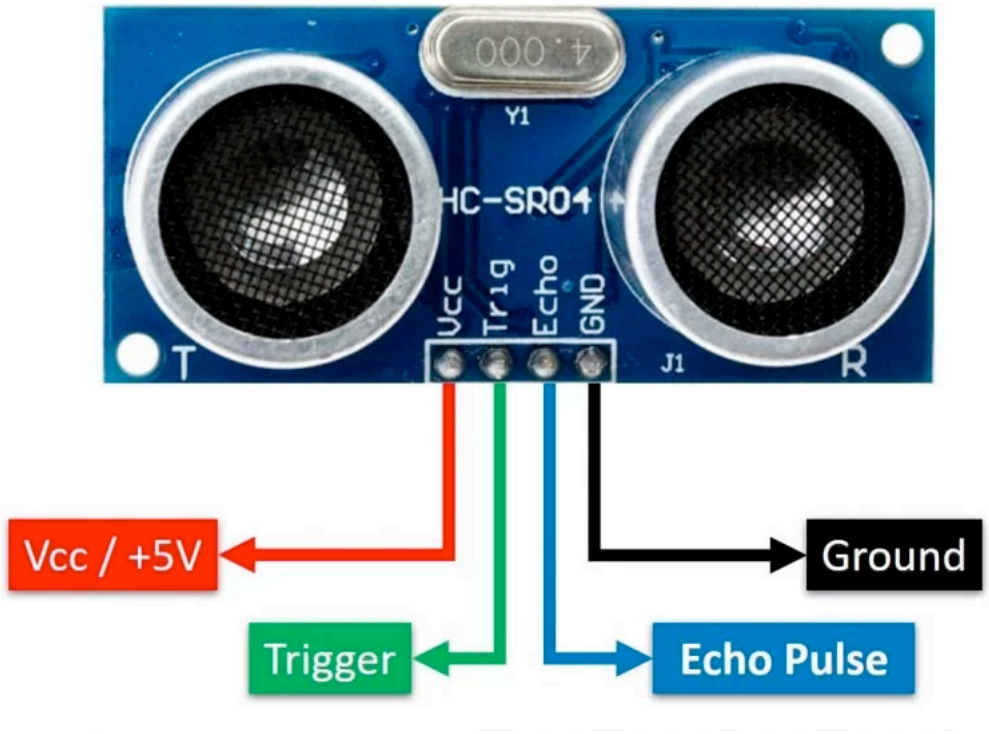
Dual Axis Joystick Module

The **joystick module** consists of two potentiometers and one Switch



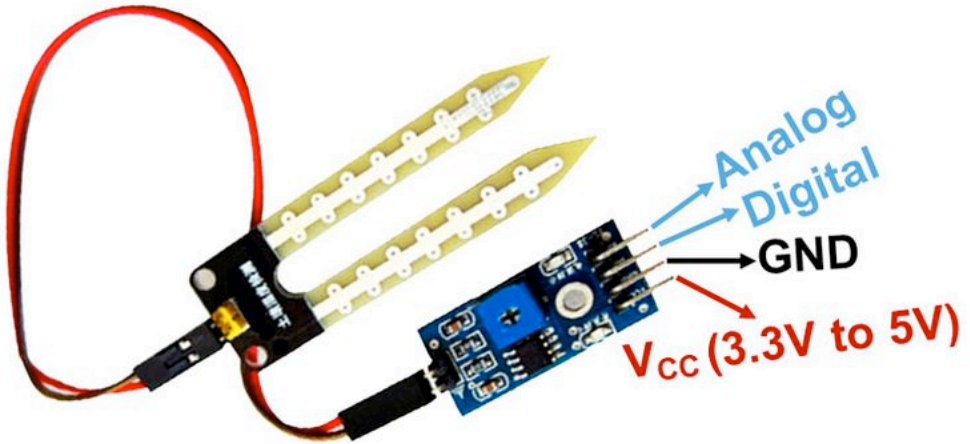
Ultrasonic Sensor

Ultrasonic sensors are used in robotics and other applications that require reliable presence, proximity, or position sensing.



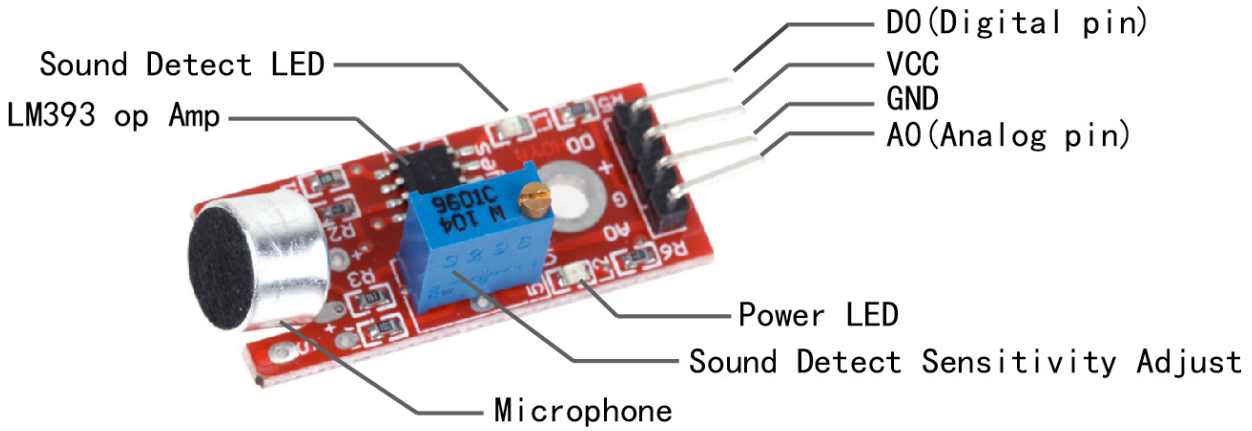
Soil Moisture Sensor

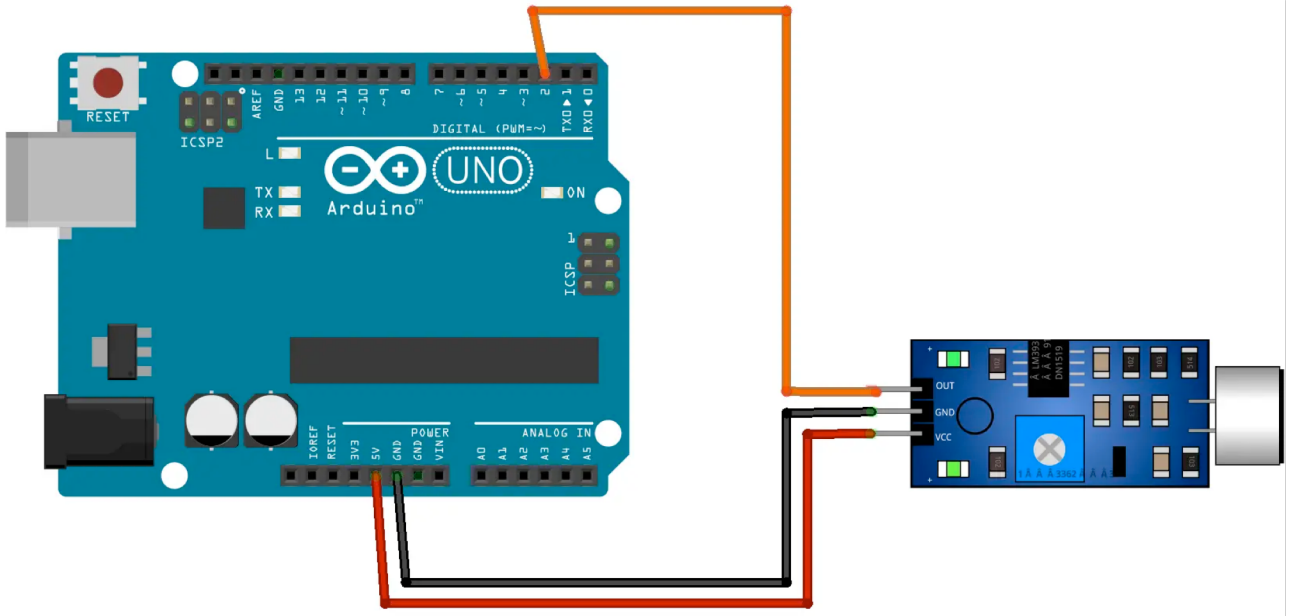
to study soil properties, climate, environmental science, and solute transport.



Sound Sensor

Home automation systems like controlling the lighting of the bulbs by detecting the claps/whistles sounds.

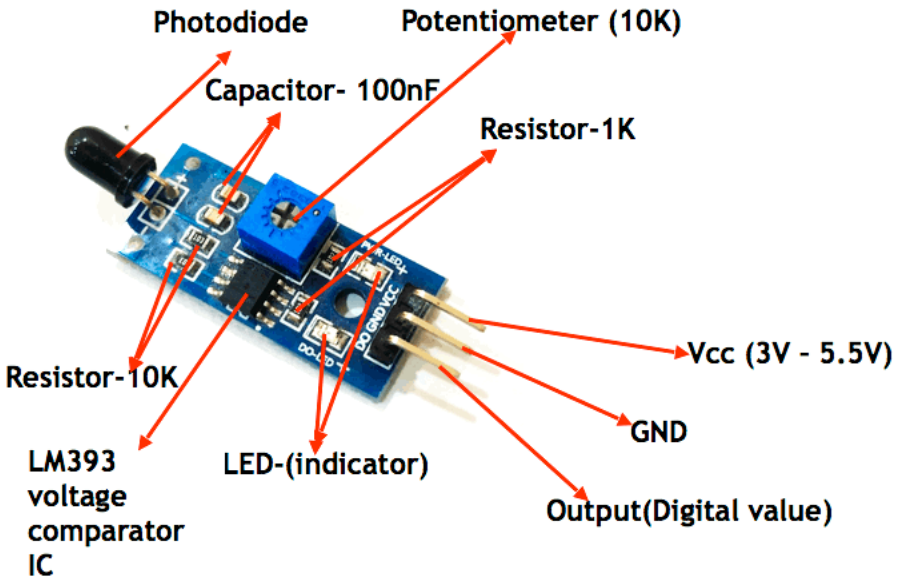


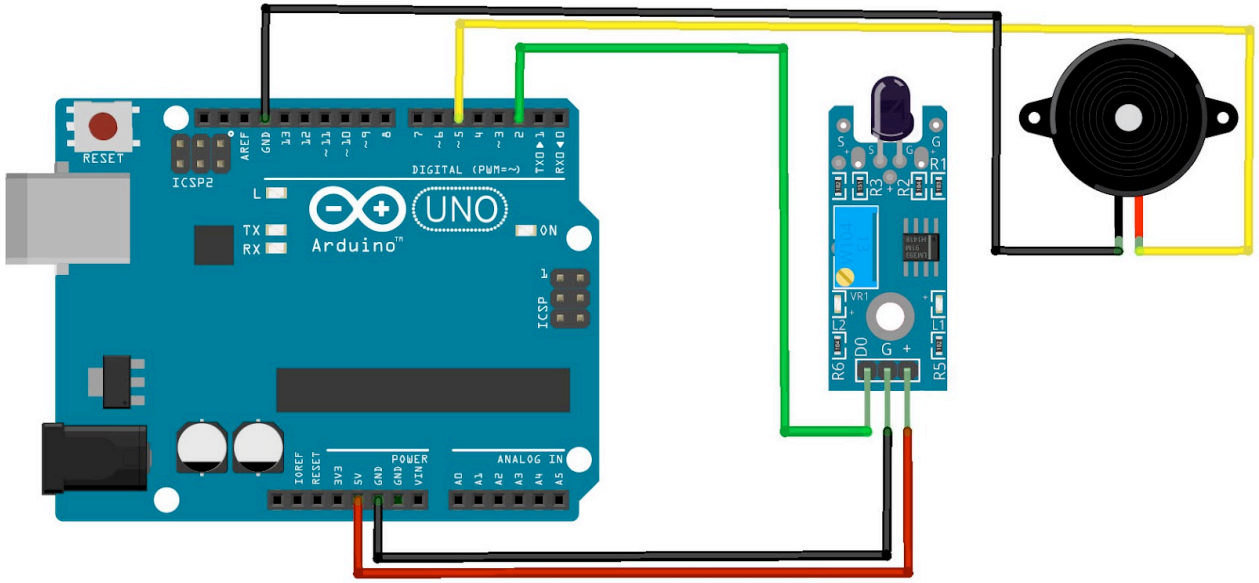


LDR Sensor

These resistors are mainly used when there is a need to sense the absence and presence of the light such as burglar alarm circuits, alarm clock, light intensity meters, etc.

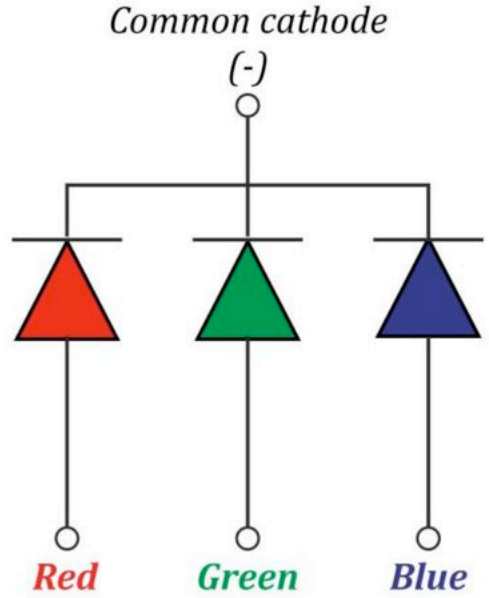
Flame Sensor





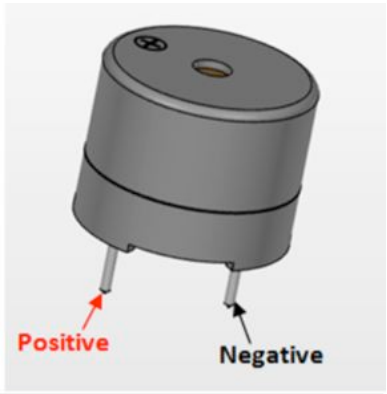
RGB Sensor

An RGB sensor can independently detect the color intensity of red, green, and blue colors. It can also measure brightness.

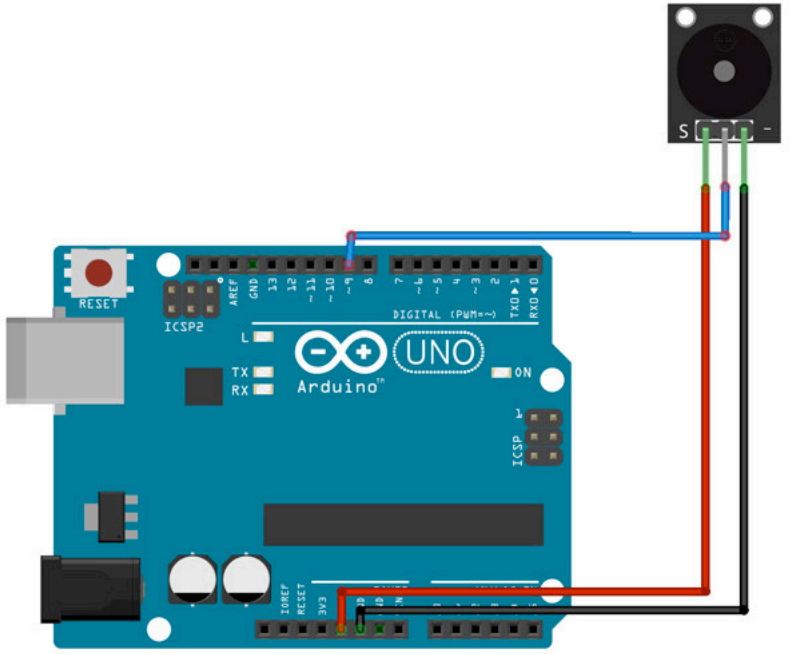


Active Piezo buzzer

Active Passive Buzzer

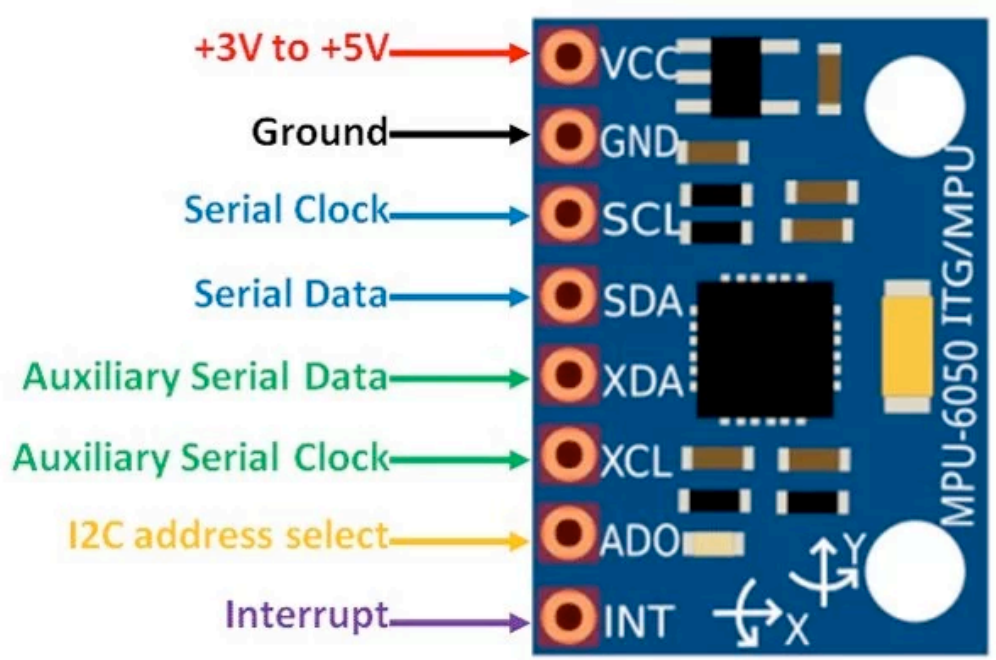


Active Passive Buzzer Pinout



Gyroscope Sensor

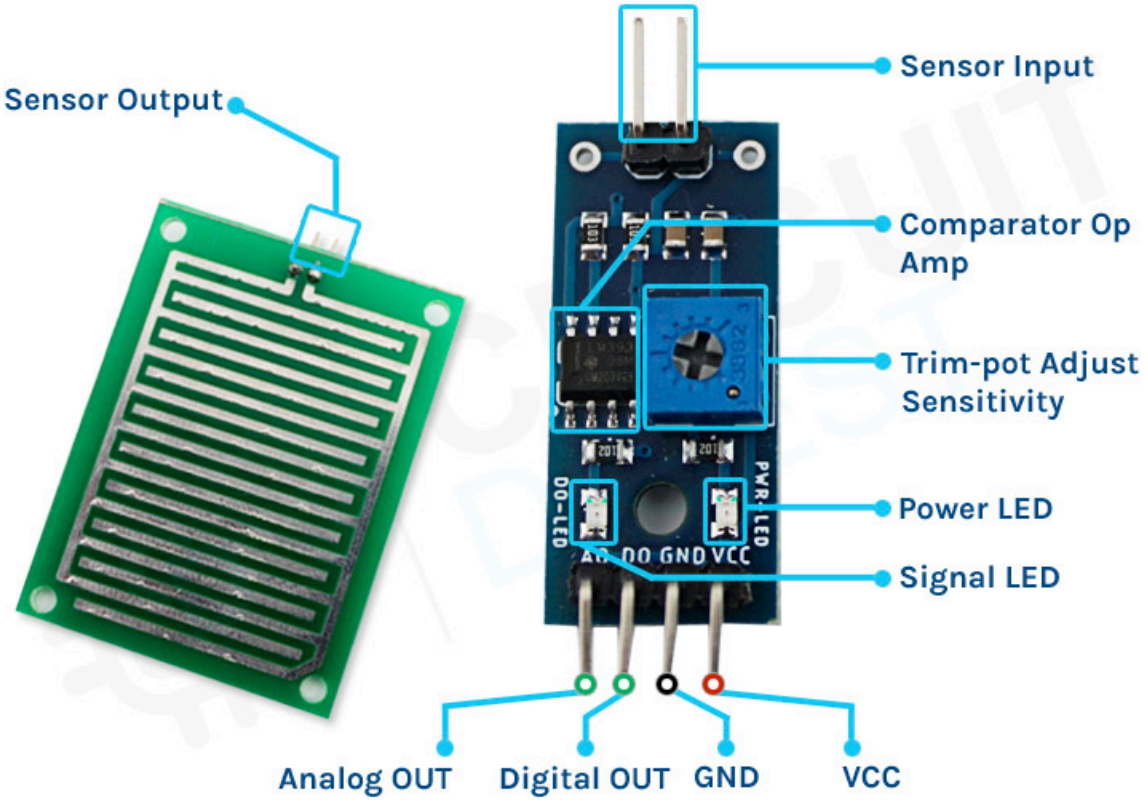
Gyroscope sensor is a device that can measure and maintain the orientation and angular velocity of an object.



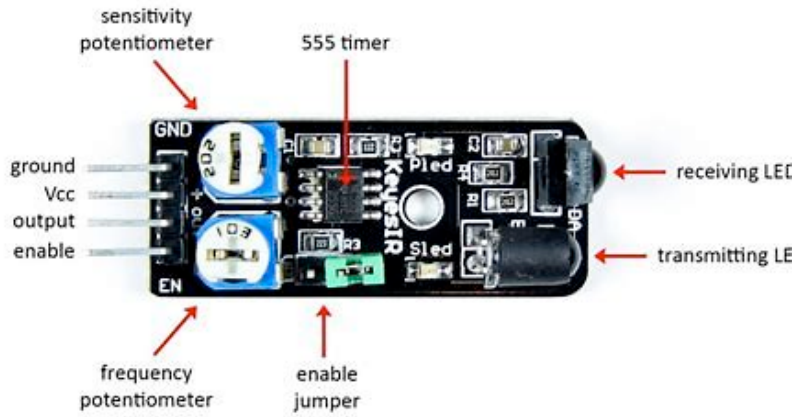
MPU6050 Pinout

Rain Drop Sensor

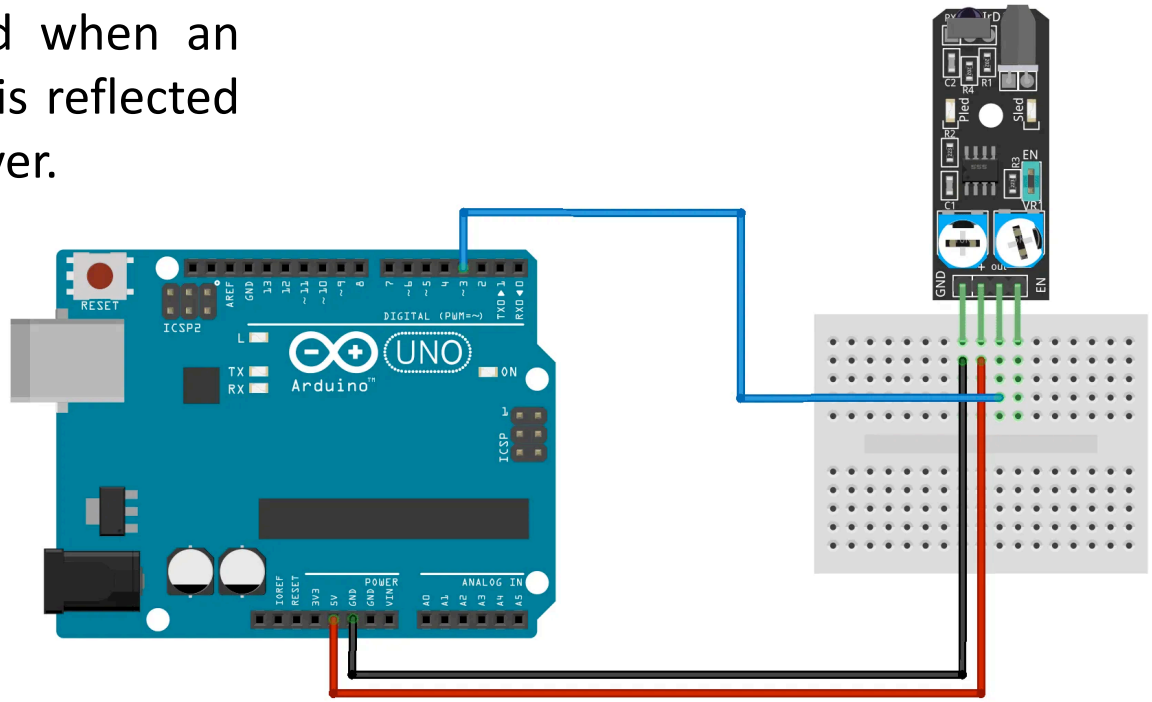
Used for the detection of rain and also for measuring rainfall intensity.



Obstacle Avoid Sensor module

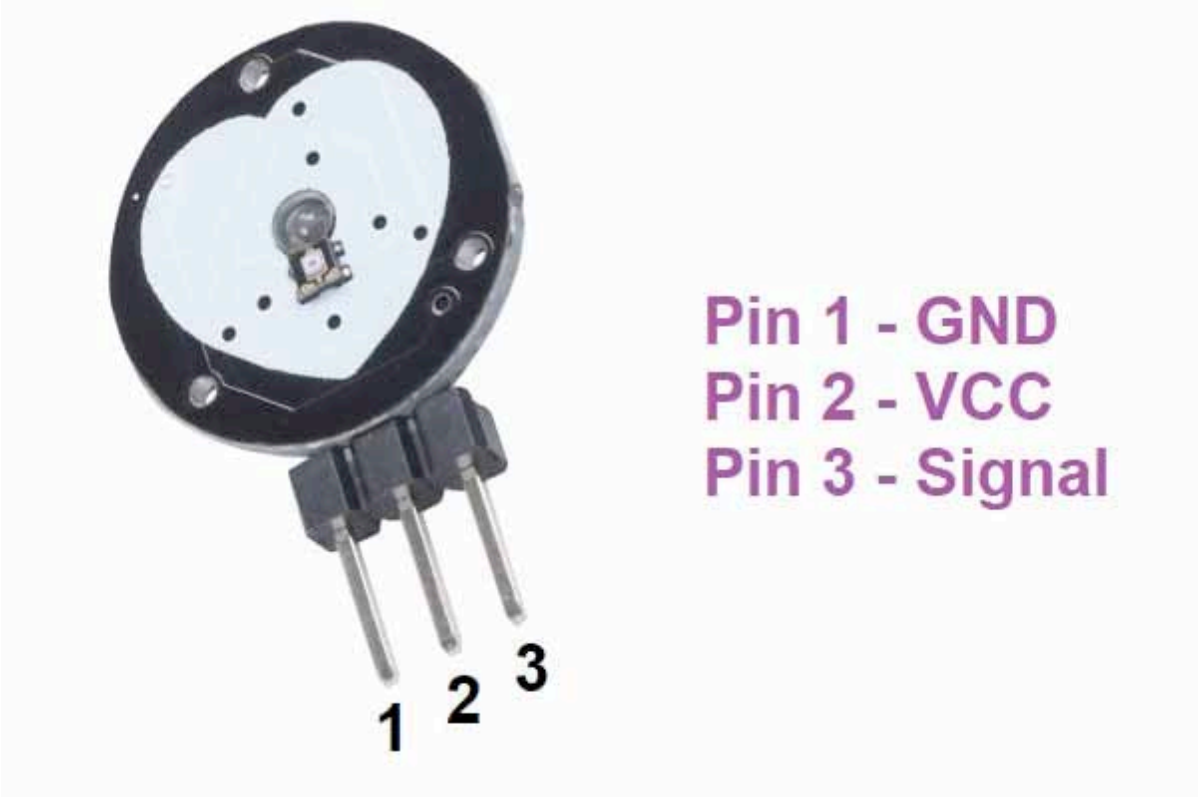


The Infrared Obstacle Avoidance Sensor has a pair of infrared transmitting and receiving sensors. The infrared LED emits Infrared signals at certain frequency and when an obstacle appears on the line of infrared light, it is reflected back by the obstacle which is sensed by the receiver.



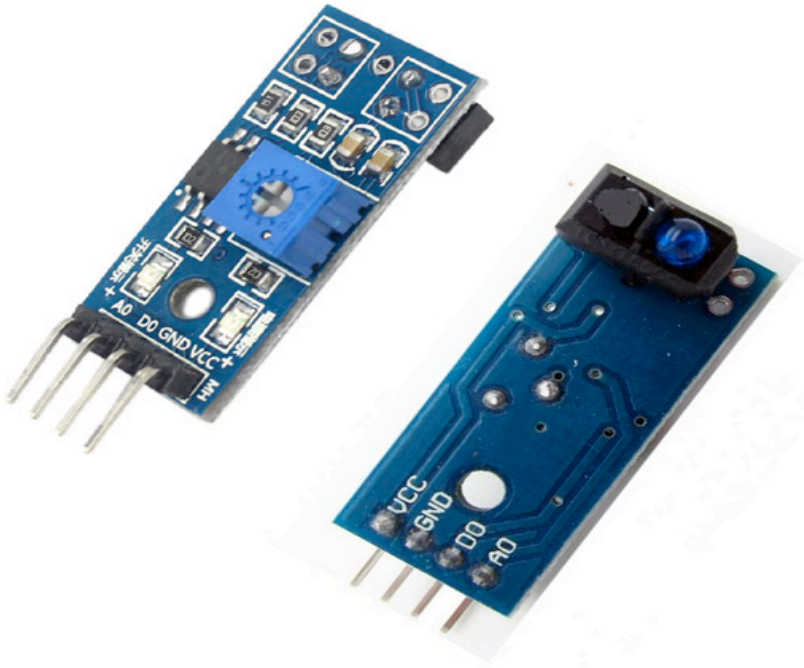
Oximeter Sensor

The pulse oximeter, or Pulse Ox, is an electronic device that measures the saturation of oxygen carried in your red blood cells.



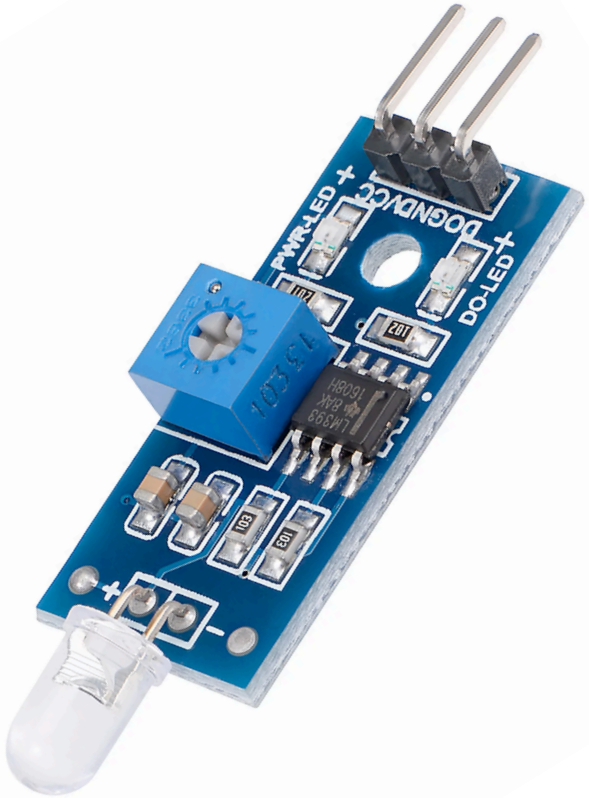
Line Follower Sensor

The line follower IR sensor is capable of following a black line on a white surface autonomously and with no external control. It is made up of an infrared LED and a phototransistor placed next to each other. The LED acts as a transmitter, and the phototransistor acts as a receiver.



Photosensitive Diode Sensor

Photosensitive diode is actually a kind of photosensitive resistance, it is ***very sensitive to the light***. Inside the diode is a PN junction electricity can only flows unidirectionally, thus the changing light changes the electricity in the circuit. It means, the stronger the light is, the less the resistance becomes.

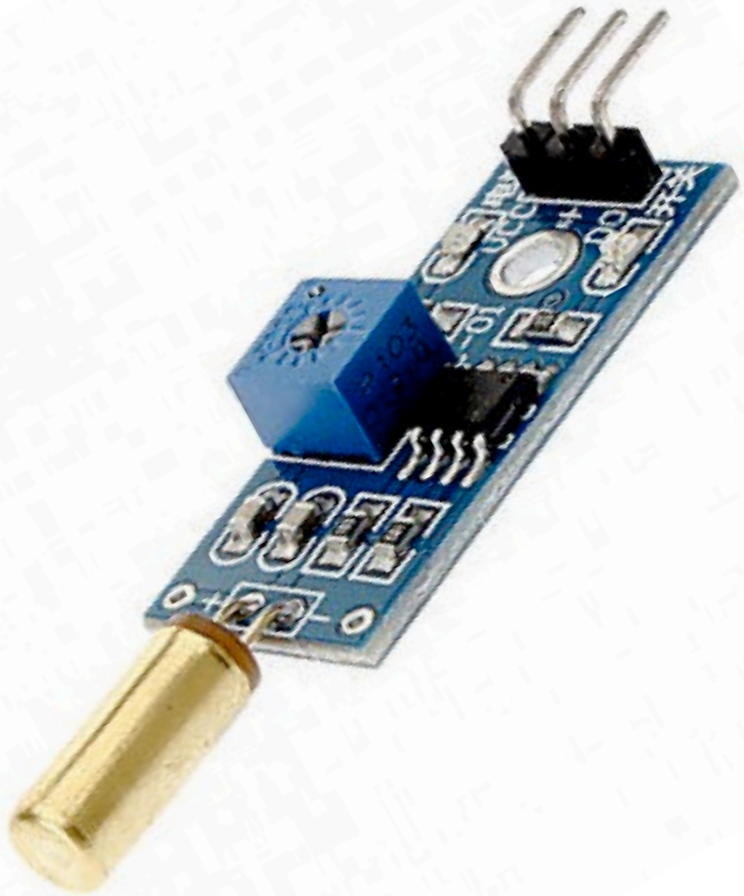


IR Proximity Sensor

IR, in short for infrared, detects the presence of an object by emitting a beam of infrared light. It works similarly to ***ultrasonic sensors***, though instead of using sonic waves, IR is transmitted. Infrared proximity sensors consist of an IR LED that emits, and a light detector for detection of reflection.

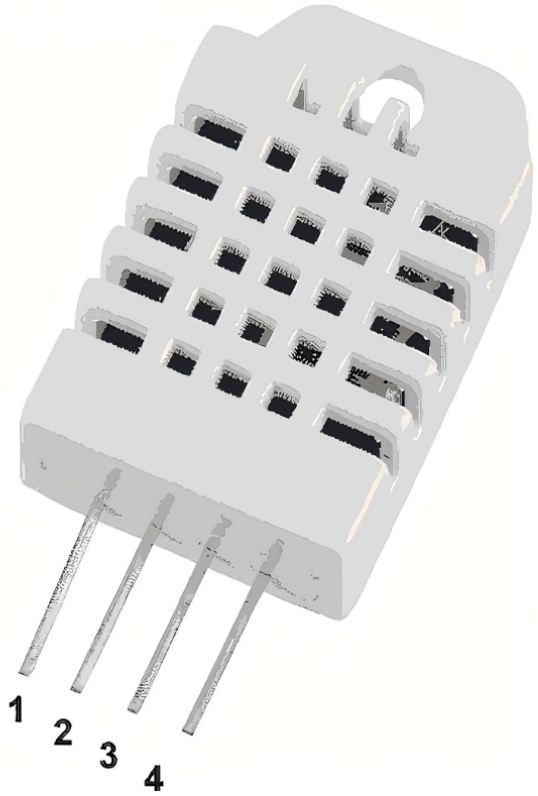
Tilt Sensor Module

Tilt sensors are devices that produce an electrical signal that varies with an angular movement.



DHT22
Temperature & Humidity

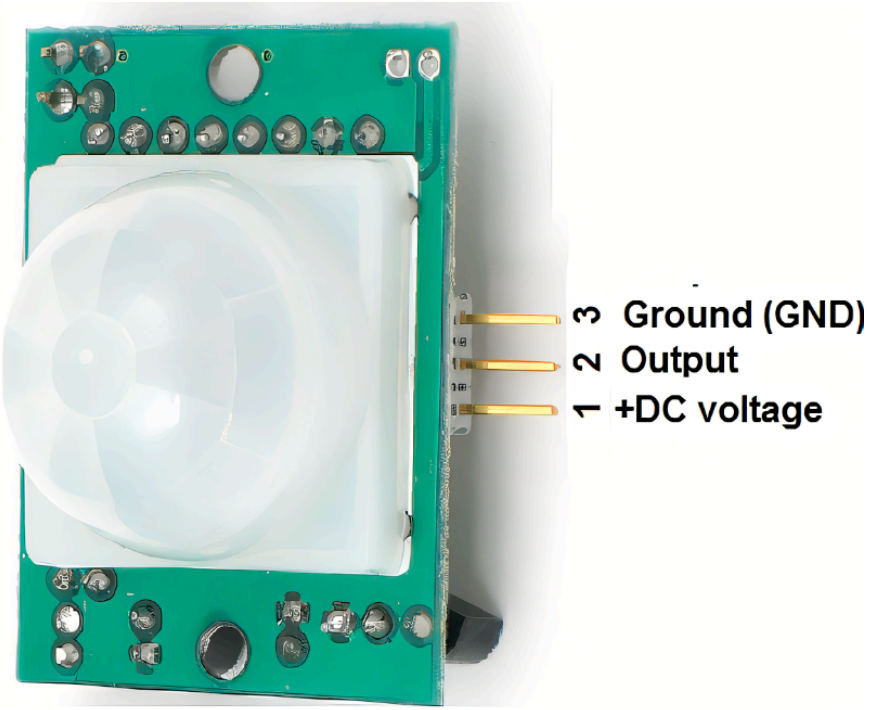
DHT22 pins	
1	VCC
2	DATA
3	NC
4	GND



The DHT22 is a basic, digital temperature and humidity sensor. It uses a capacitive humidity sensor and a thermistor to measure the surrounding air and sends out a digital signal on the data pin (no analog input pins needed).

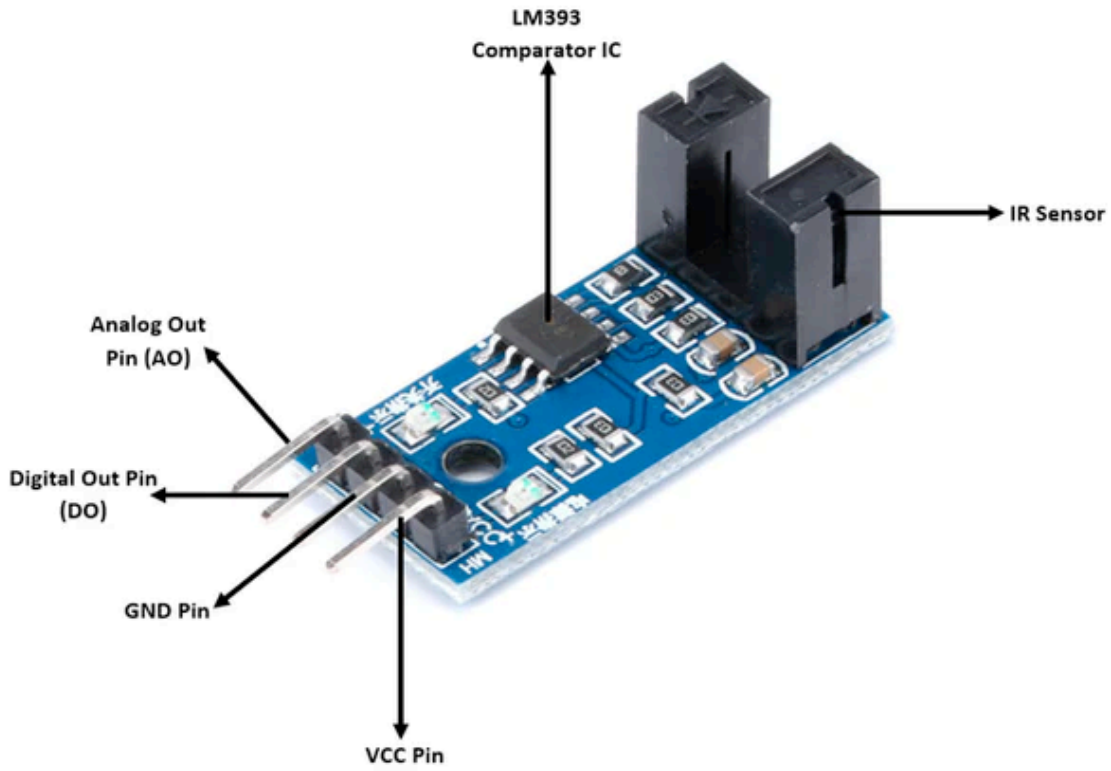
PIR Sensor

A passive infrared sensor (PIR sensor) is an electronic sensor that measures infrared (IR) light radiating from objects in its field of view.



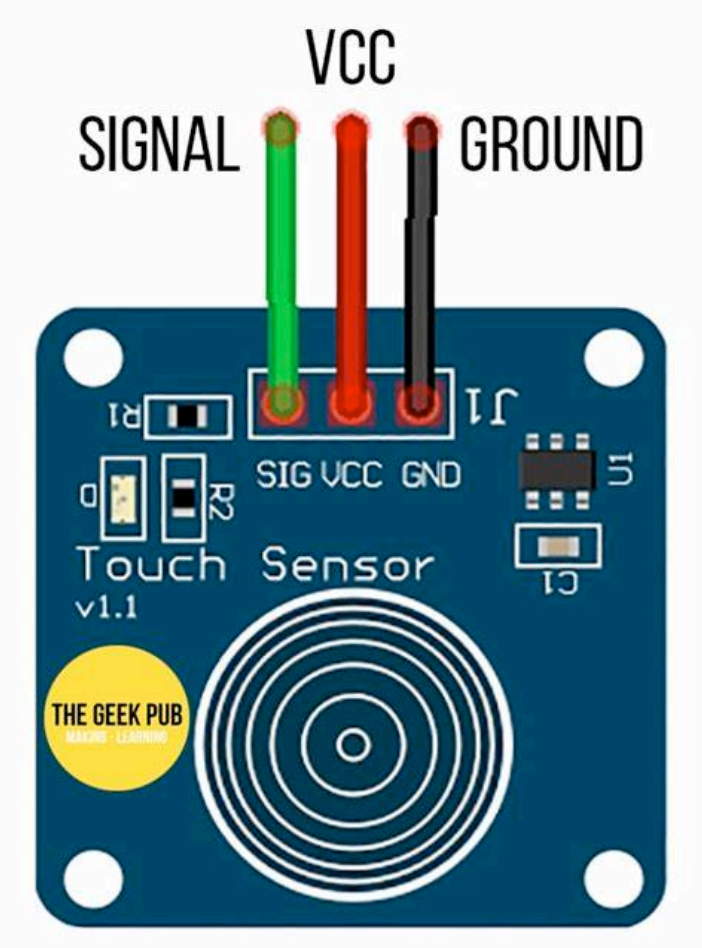
Speed Sensor

A speed sensor is a type of position sensor which is used to measure rotational speed. They are present in various types of commercial and motorsport vehicles.



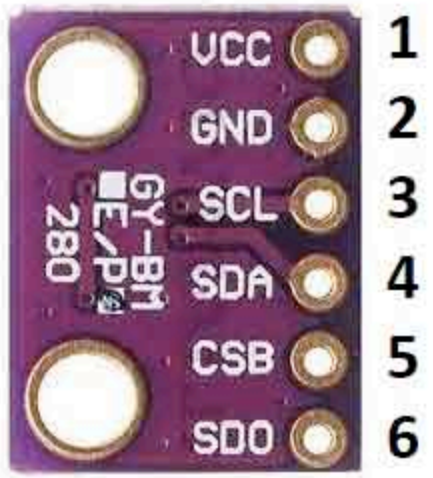
Touch Sensor

A touch sensor is a type of device that captures and records physical touch or embrace on a device and/or object. It enables a device or object to detect touch or near proximity, typically by a human user or operator.



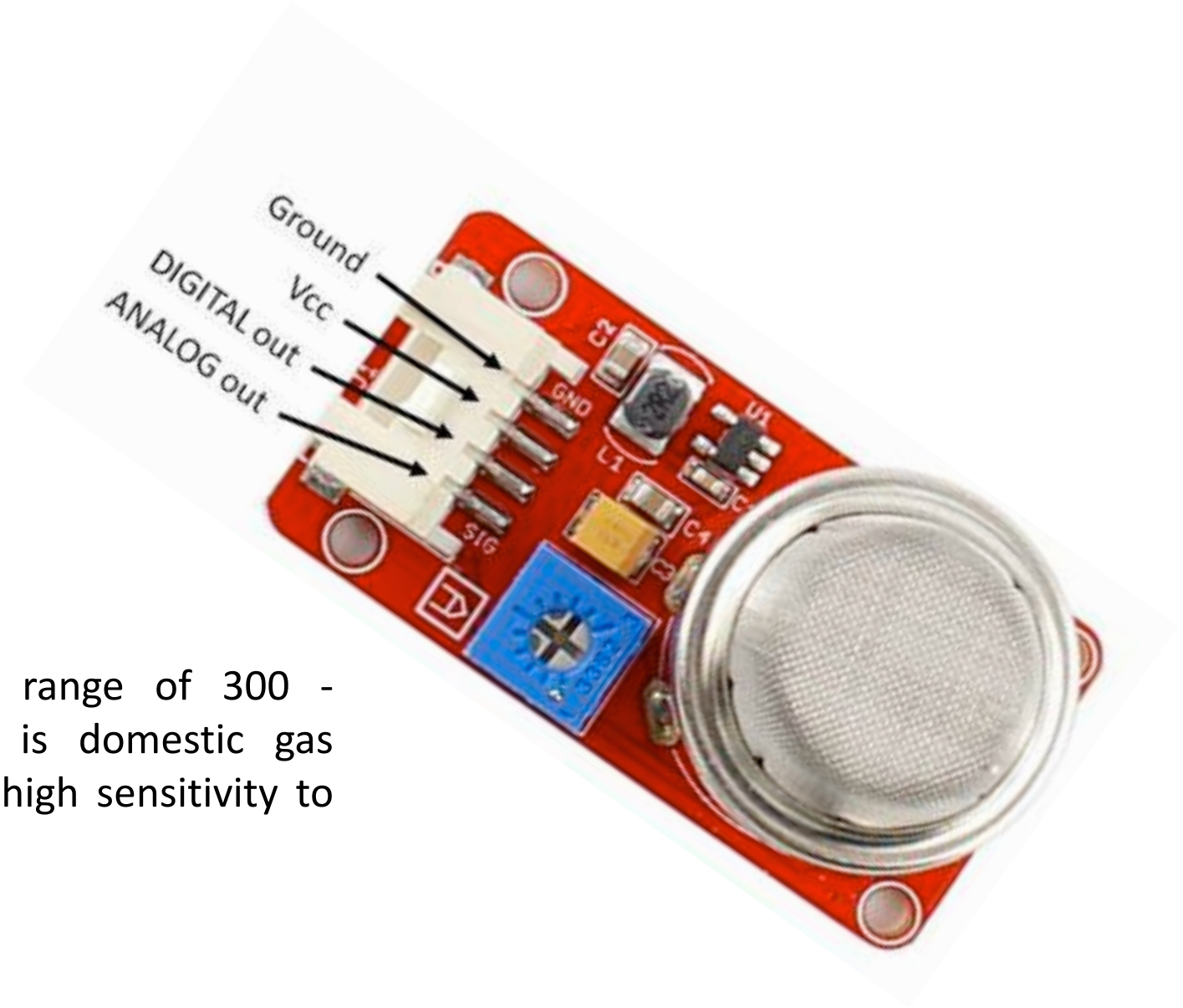
Barometric Pressure Sensor – BMP280

Sensor is an advanced digital gadget that boasts a remarkable ability to gauge atmospheric pressure and temperature with precision.



Pin 1 - VCC
Pin 2 - GND
Pin 3 - SCL
Pin 4 - SDA
Pin 5 - CSB
Pin 6 - SDO

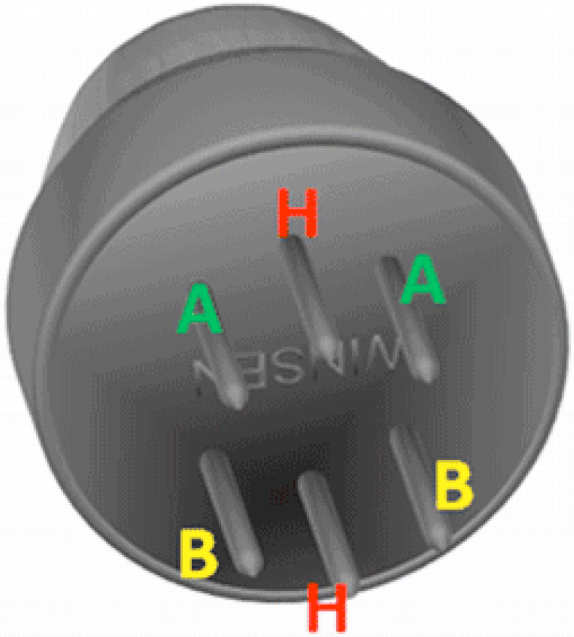
MQ2 Sensor

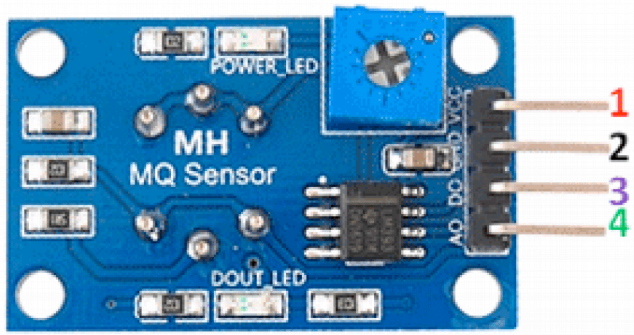


It can detect flammable gas in a range of 300 - 10000ppm. It's most common use is domestic gas leakage alarms and detectors with a high sensitivity to propane and smoke.

MQ6 Sensor

Gas Sensor mainly used to detect the LPG and Butane gas concentration in the air either at home or in industry.



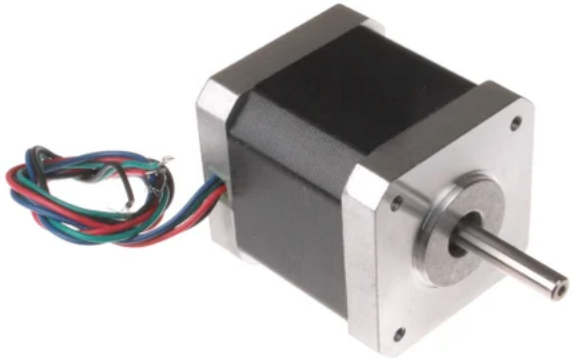


Pin No.	Pin Name
1	Vcc(+5V)
2	Ground
3	Digital Out
4	Analog out

Actuators

DC Servo motor

AC motor



DC Stepper motor


BEST OF LUCK