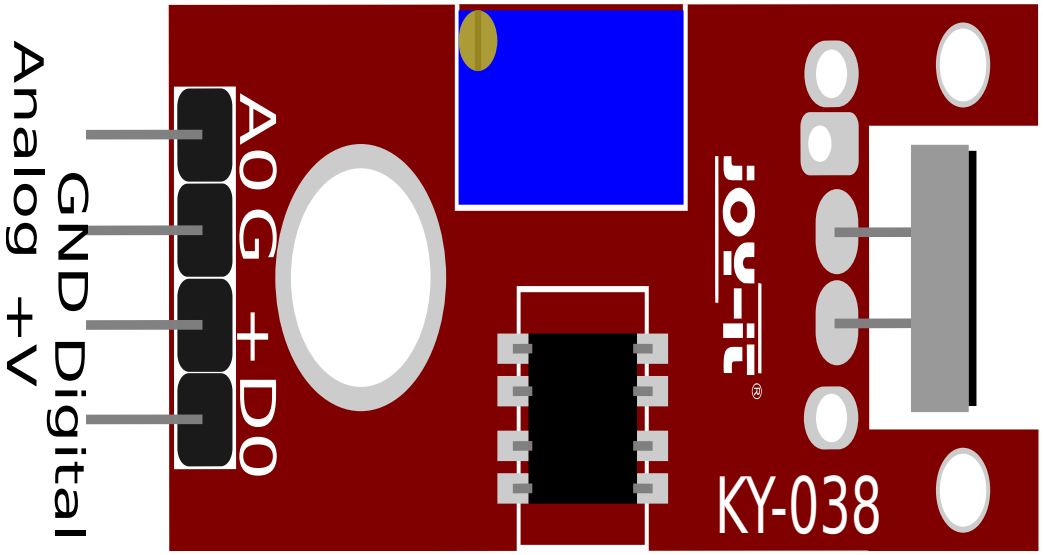
Sound Sensor



This sensor is ideally suited for threshold measurement. This means that the sensor emits a digital high signal as soon as a threshold value set by the user is exceeded. However, this also means that the analog measured values are not suitable for conversions, as the analog signal is also influenced by the rotary potentiometer.

Digital output: Via the potentiometer, a limit value for the received sound can be set, at which the digital output should switch.

Analog output: Direct microphone signal as voltage level

LED1 : Shows that the sensor is powered

LED2 : Indicates that a noise has been detected

Function of the sensor

This sensor has three functional components on its circuit board: The front sensor unit, which physically measures the environment and outputs it as an analog signal to the second unit, the amplifier. This amplifies the signal depending on the resistance set on the rotary potentiometer and sends it to the analog output of the module.

Here it is to be noted: The signal is inverted. If a high value is measured, this results in a lower voltage value at the analog output.

The third unit represents a comparator, which switches the digital output and the LED when the signal falls below a certain value. This value (and thus the sensitivity of the module) can be adjusted via the rotary potentiometer.

Working of sound sensor

- The working of this **Sound detector** is very similar to sensor which are built out of LM393 IC. The link to other sensors which are similar to it are also included in the basic electronic section.
- The inverting input of the one comparator is connected to the positive pin of the condenser microphone with a resistor of 150 Ω in series.
- The non-inverting input of both the comparators is connected to the voltage divider of 100 kΩ each between VCC & GND.
- The output of the first comparator is connected to the digital output and inverting input of the second comparator. The output of 2^{nd} is connected to the VCC of the indicator LED with 10 kΩ in series.
- The potentiometer is connected to the inverting input of the first comparator with VCC. Also the analog input is connected to this pin also.

Advantages:

- The main advantage of the **Sound sensor** is the simplicity of the sensor, which makes it ideal sensor that can be use by the beginners for making a grip in this field.
- Secondly the condenser microphone it can be replaced in case of any damage also you can replace it with some high quality condenser microphone as per your need.
- Furthermore, sensor also give analog output which though is unstable yet still useful in some cases, like in making VU meter for DIY projects and stuff like this.
- The pull-up to the microphone input to the inverting input of the Op-Amp can be controlled with the potentiometer, which directly affects the output in both digital and analog ones.

Disadvantages:

- The main disadvantage is the noise in the analog input of the sensor, which makes it really unstable, as it can be clearly observed using an Oscilloscope.

- On elevating the input voltage level the noise and the logic level of the whole system elevates which can be quite dangerous for the low logic level microcontrollers and development boards
- Condenser microphones are not the best choice for these purposes, so I’ll advise you to switch to some better version for professional work, or the noise