



# Stick for blinds

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# Introduction

We have made a stick for blinds using arduino which helps the visually impaired to perform day-to-day activities.

The components used are :

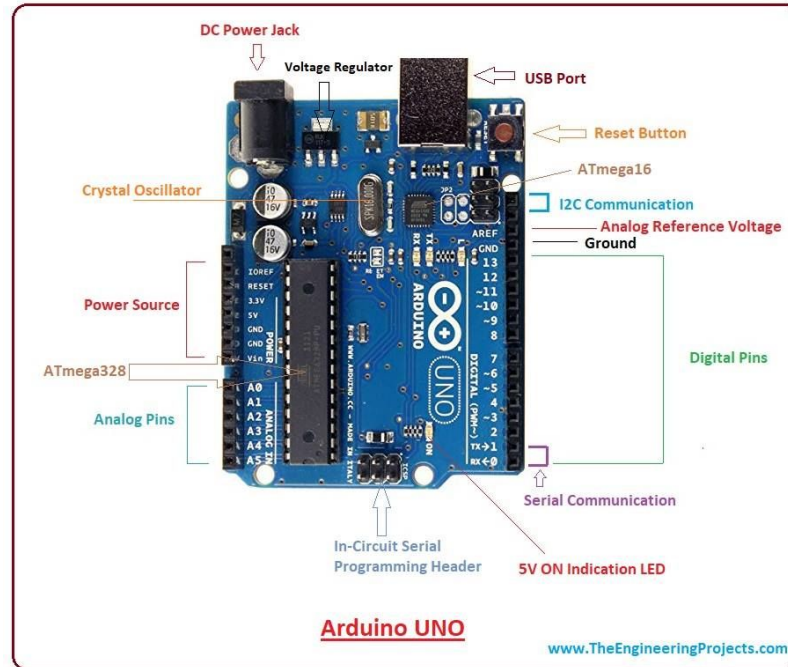
- Arduino
- PIR sensor
- Ultrasonic sensor
- Buzzer



# Arduino

Arduino is an open-source electronics platform based on easy-to-use hardware and software. Arduino boards are able to read inputs - light on a sensor, a finger on a button, or a Twitter message - and turn it into an output - activating a motor, turning on an LED, publishing something online.

# Arduino



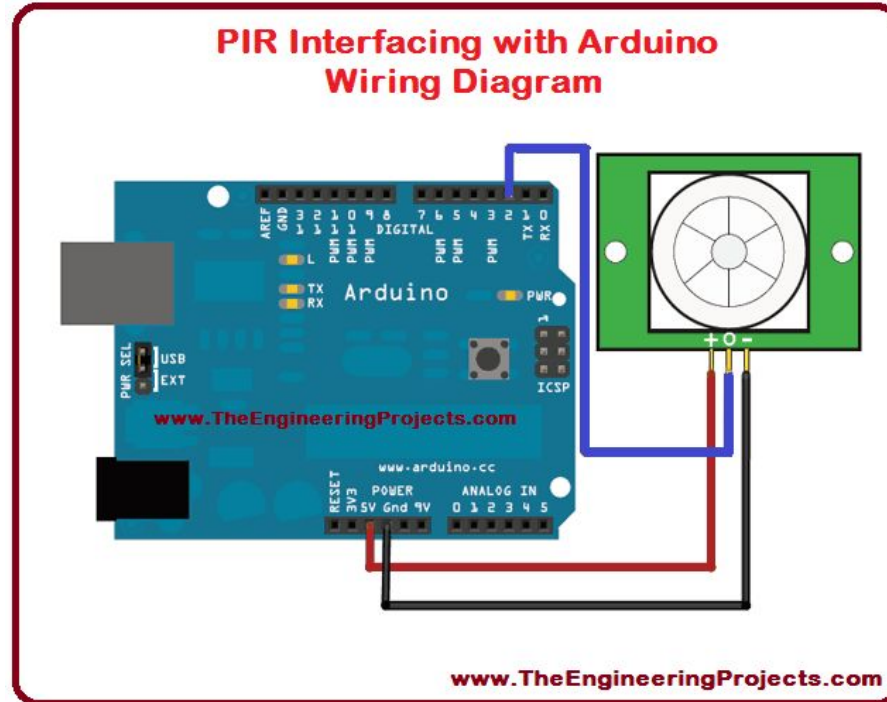


## PIR sensor

Passive infrared (PIR)- HCSR501 sensors use a pair of pyroelectric sensors to detect heat energy in the surrounding environment. These two sensors sit beside each other, and when the signal differential between the two sensors changes (if a person enters the room, for example), the sensor will engage.

- Voltage- 4.8V to 20V
- Sensing range- within 7meters

# Interfacing Diagrams of: PIR-





# Ultrasonic sensor

## HC-SR04 SENSOR FEATURES

operating voltage: +5v

theoretical measuring distance: 2cm to 450cm

practical measuring distance: 2cm to 80cm

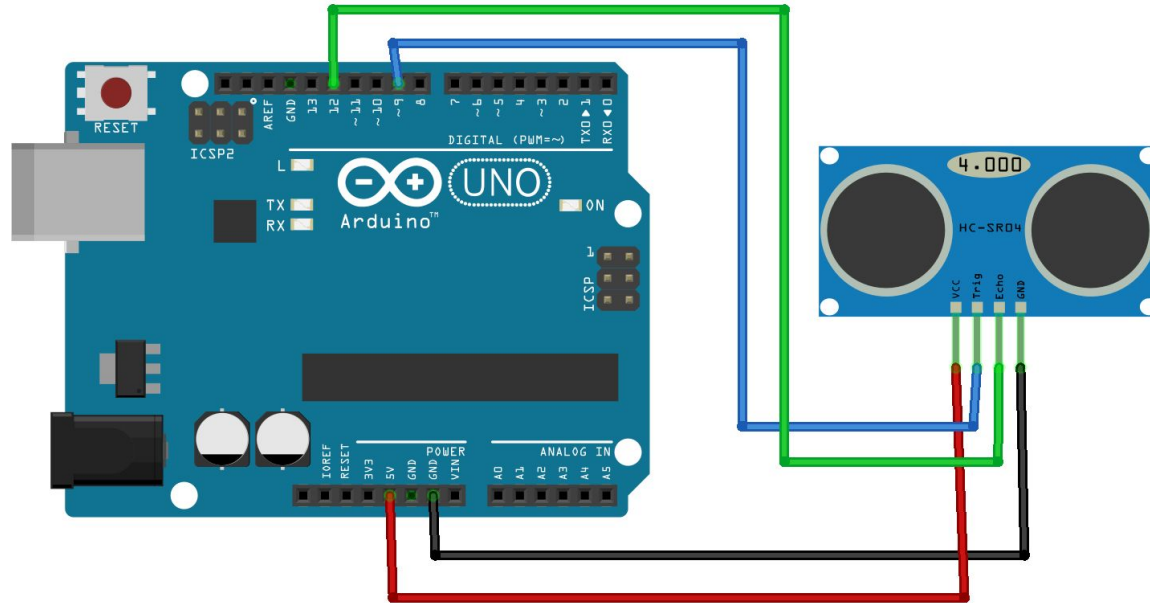
accuracy: 3mm

measuring angle covered:  $< 15^\circ$

operating current:  $< 15\text{ma}$

operating frequency: 40hz

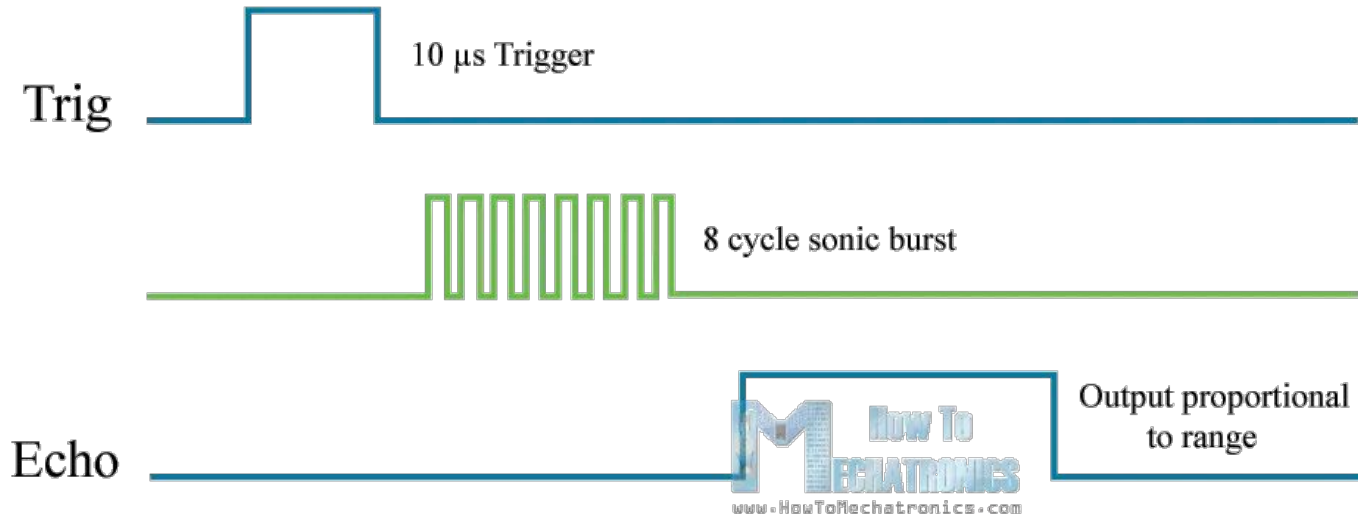
# Ultrasonic



fritzing



# Timing Diagram for Ultrasonic





## Buzzer

A buzzer is a common feature in electronic products and can provide an effective way of interacting with users or raising an alarm. depending on the type and strength of the signals available to drive the buzzer, the physical space available, and the required audio sound pressure level (spl), a magnetic or piezoelectric type will be the most common options for your application.



# Datasheets

Ultrasonic:

<https://drive.google.com/file/d/1m5EL9S0nCTobbOXwwHdzLaYMBGNaEsMc/view?usp=sharing>

PIR:

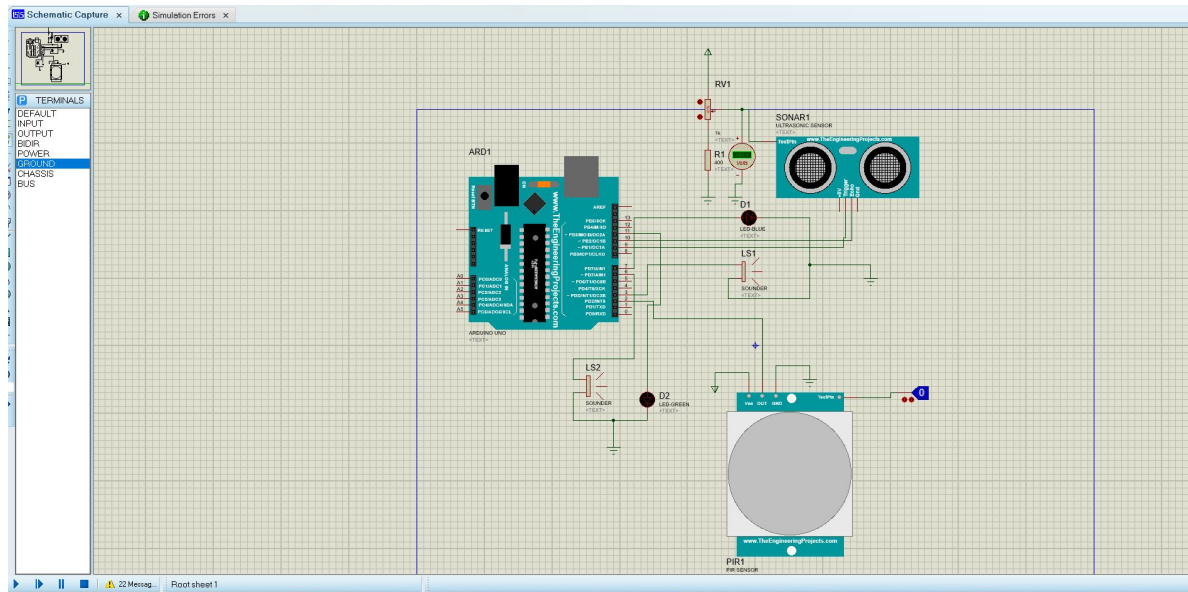
<https://www.homemade-circuits.com/pir-sensor-datasheet-pinout-specification-working/>



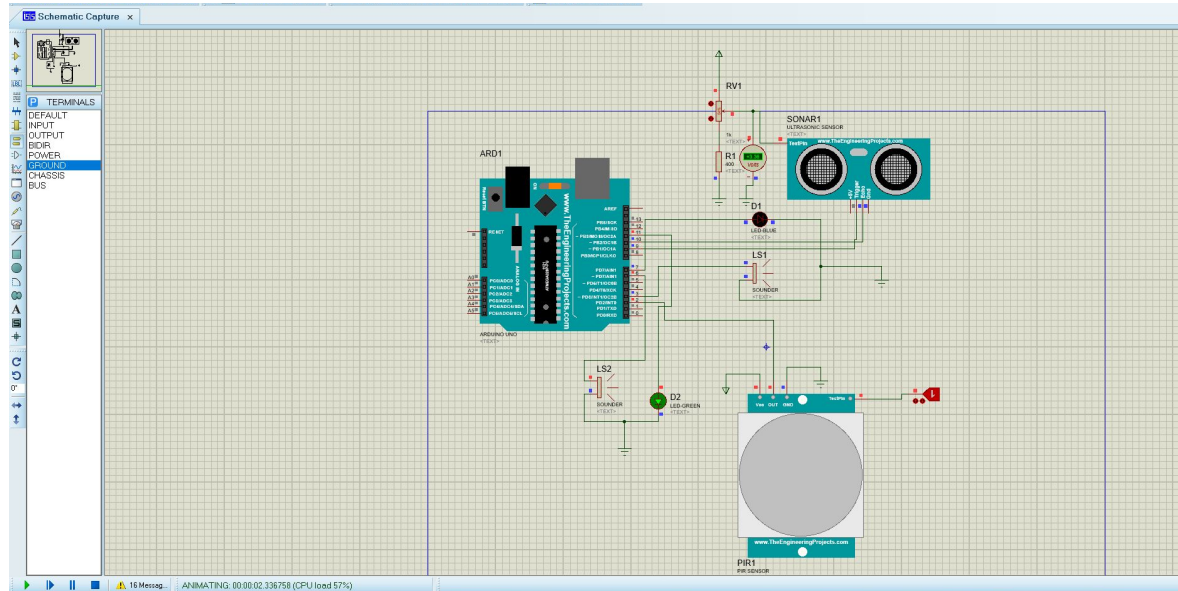
## Working

- The Smart Blind Stick scans the path in front of it with the help of an HC-SR04 [Ultrasonic sensor](#).
- Whenever the sensor detects any object in its path the buzzer starts beeping and also at the same time the LED turns on.
- The blind person can hear the beeping of the buzzer and manage to change the way. In this way, the person can easily find his way without getting injured.
- This smart stick works in the same way as the [Ultrasonic range finder](#) did. You can also see the real-time values of the distance in cm on the Arduino serial monitor.

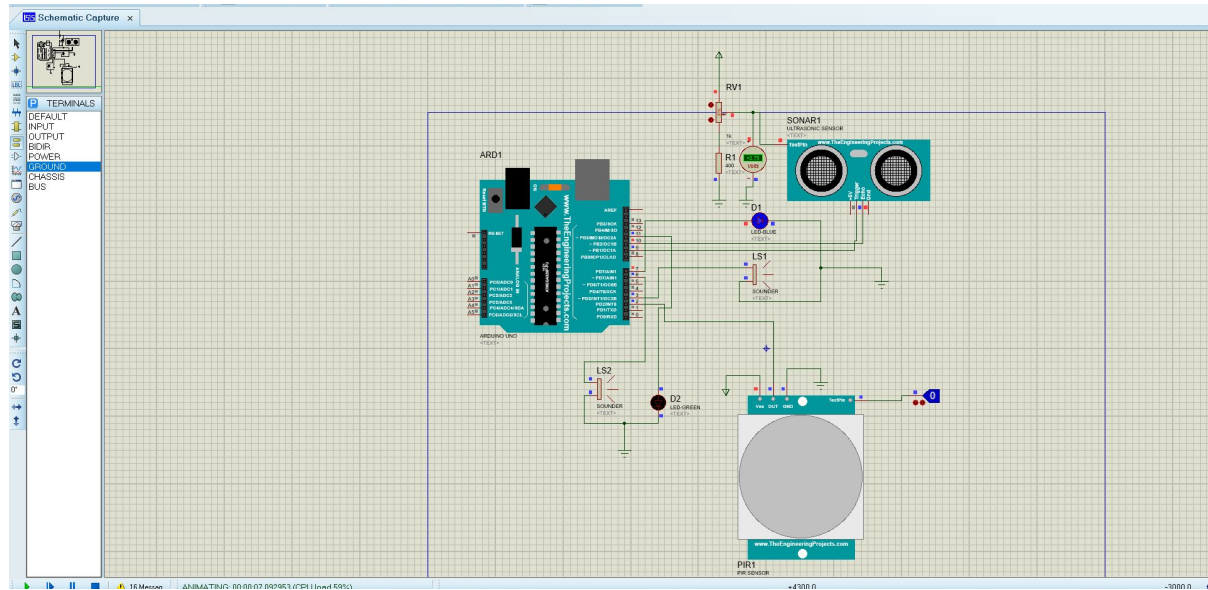
# Interfacing Diagram



# PIR Sensor Output



# Ultrasonic Sensor Output





## Conclusion

The Smart Stick acts as a basic platform for the coming generation of more aiding devices to help the visually impaired to be more safe. It is effective and affordable. It leads to good results in detecting the obstacles lying ahead of the user in a range of 45 cms, detecting stairs and humans. This system offers a low-cost, reliable, portable, low- power consumption and robust solution for navigation with obvious short response time. Further aspects of this system can be improved via wireless connectivity between the system components, thus, increasing the range of the ultrasonic sensor and implementing a technology for determining the speed of approaching obstacles.