

Lego Mindstorms EV3 – Ultrasonic Sensor

Ashish Sureka

<http://www.robo-paathshaala.in>

Email: ashish@robo-paathshaala.in



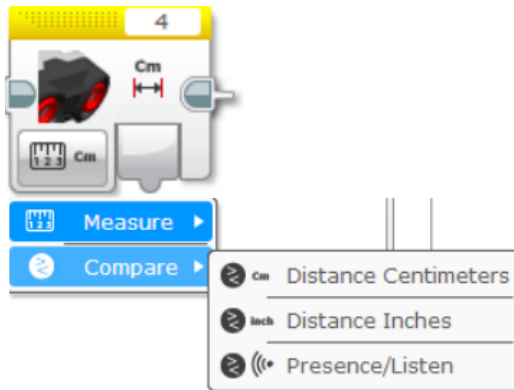
RoboPaathshaala.in

A Robotics Academy – Inspiring & Developing Specialists

EV3 Ultrasonic Sensor



- ✓ Generates sound waves and reads their echoes to detect and measure distance from objects
- ✓ Measures distances between one and 250 cm (one to 100 in.)
- ✓ Accurate to +/- 1 cm (+/- .394 in.)

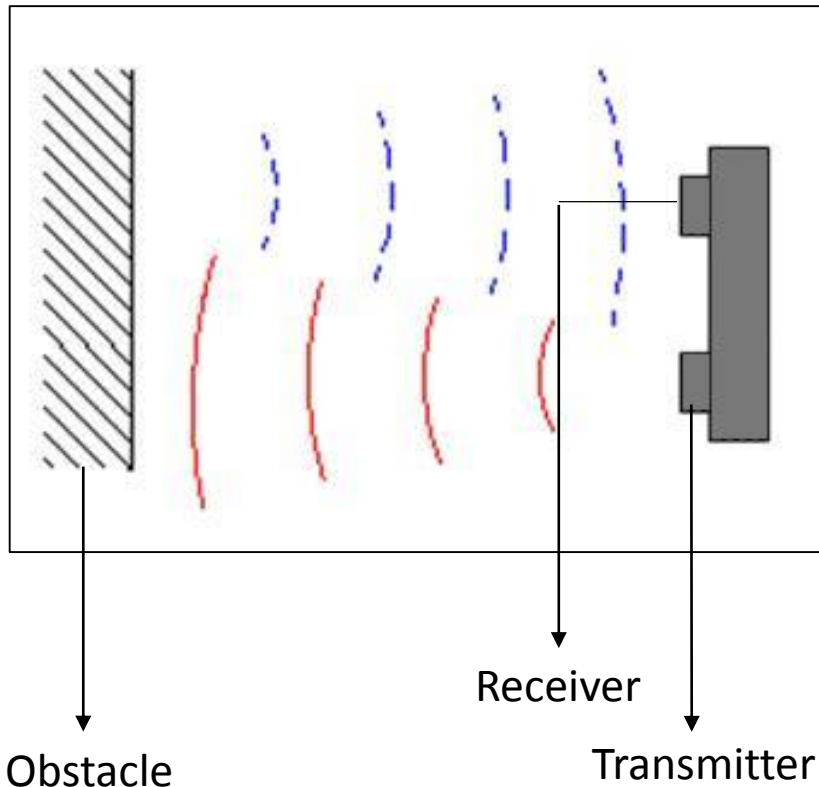


- ✓ Can measure distance in centimeters and inches
- ✓ Has two modes: Measure and Compare
- ✓ Measure reads the incoming values from the sensor
- ✓ Compare provide addition settings

Reference: <http://ev3lessons.com/>



Ultrasonic Sensor - Principles of Operation



Ultrasound has a frequency of over 20,000 Hz and is therefore inaudible to humans

Transmitter emits a sound at a defined frequency

Receiver collects the sound reflected back by obstacles

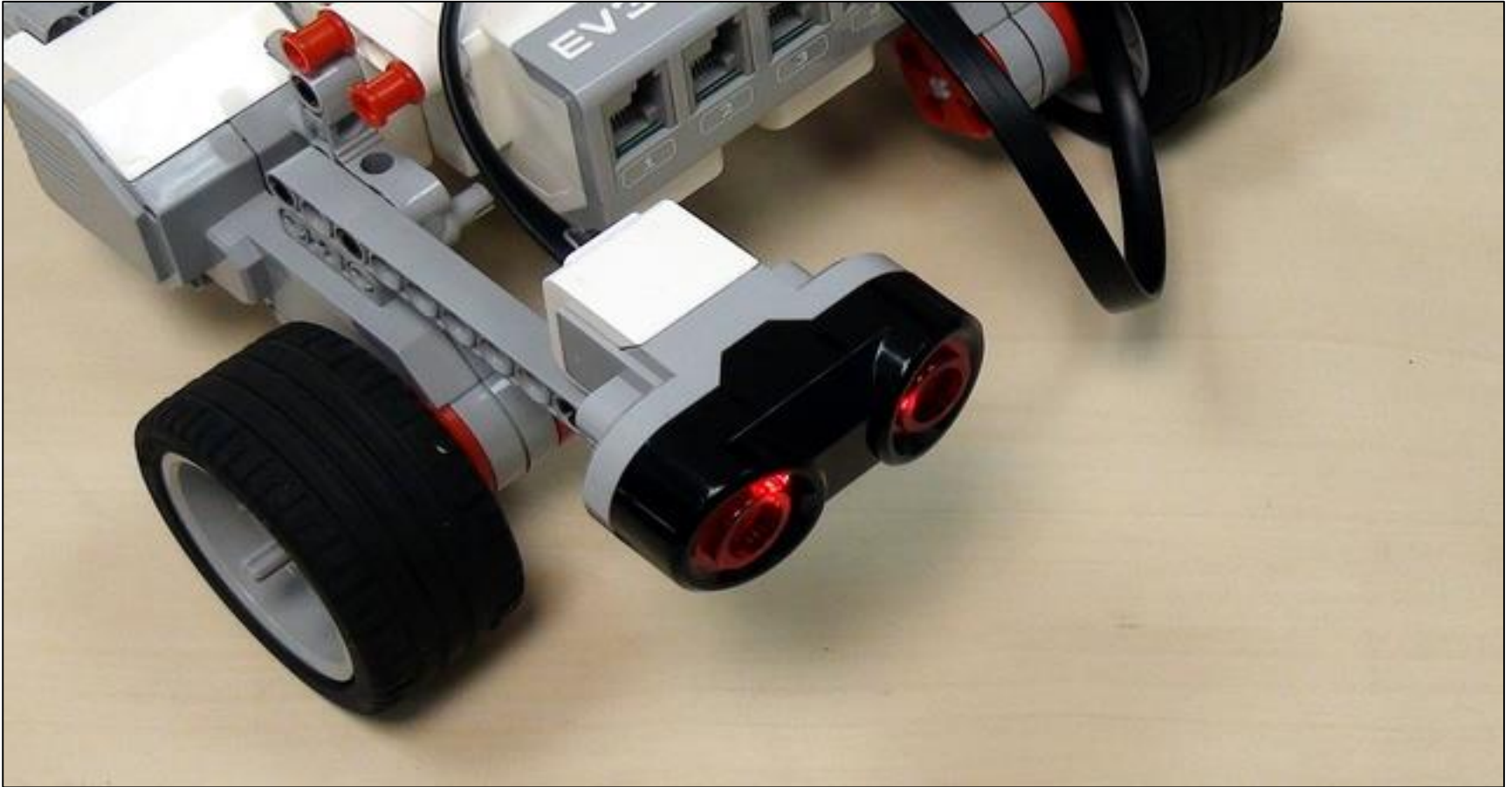
Distance to objects is calculated by measuring the time taken by the sound to return to the receiver

Sensor takes the form of a pair of eyes (transmitter, receiver)

Reference: <https://www.generationrobots.com/>



Mechanism for Detecting Obstacle – Ultrasonic Sensor

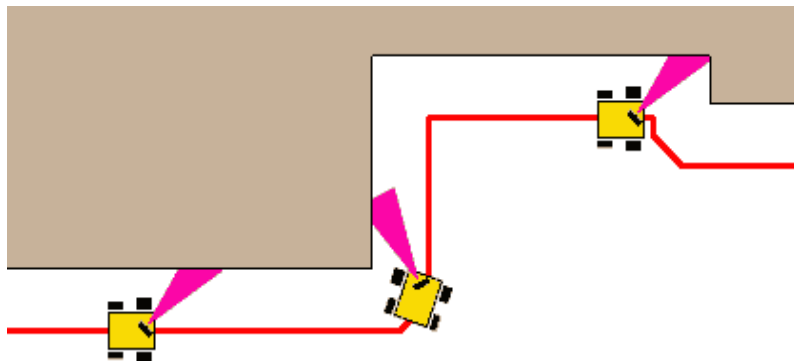


Mechanism for making the robot move until the ultrasonic sensor detects an obstacle within a distance



Activity on Ultrasonic Sensor

Write a program to have a robot **follow the wall** (always staying 15cm away from the wall) using an ultrasonic sensor?



Wall Follower Behavior

Measure the distance to the wall, and turn closer if it is too far from the wall, and turn further away if it is too close to the wall

Reference: <http://ev3lessons.com/>

The goal of this program is to make a simple wall follower

