Ultrasonic Security System

By:

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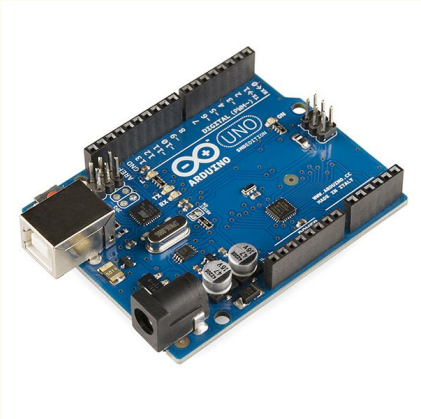
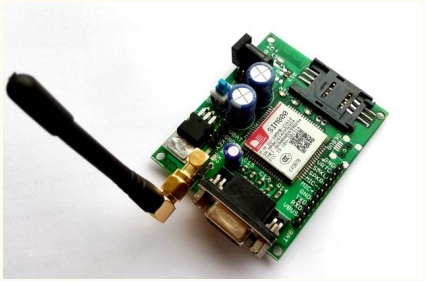
Security and distance measurement system using ultrasonic waves which is interfaced with arduino and GSM

Components

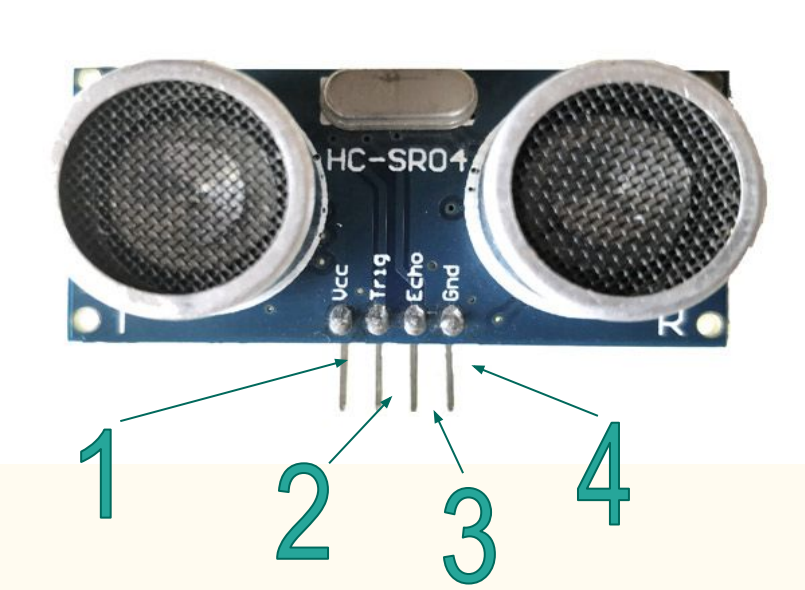
- Arduino UNO
- Buzzer
- GSM module
- BreadBoard
- Jumper wires
- Ultrasonic Sensor


UNO
ARDUINO




HC-SR04
Vcc
Trig
Echo
GND
T
R

HC-SR04:



T-Transmitter
R-Receiver

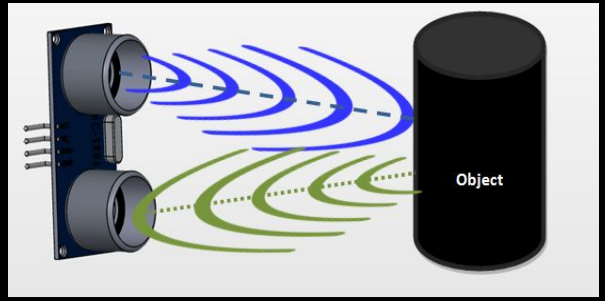
Features:

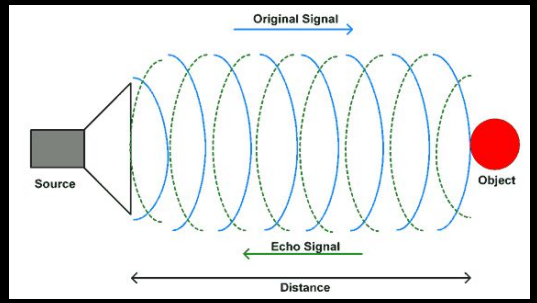
- Operating voltage:5V
- Practical measuring distance: 2cm to 80cm
- Accuracy:3mm
- Measuring angle covered:＜15 degrees
- Operating current:＜15mA
- Operating frequency:40KHz

Pin Configuration:

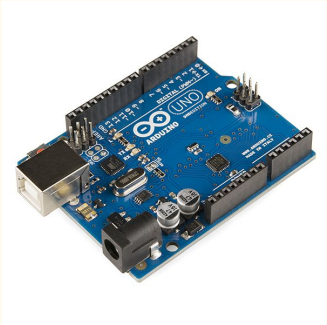
Pin Number	Pin Name	Description
1	Vcc	The Vcc pin powers the sensor typically with 5v
2	Trigger	Trigger pin is an input pin.This pin has to be kept high for 10us to initialize measurement by sending US wave
3	Echo pin	Echo pin is an output pin. The pin goes high for a period of time which will be equal to the time taken for the US wave to return back to the sensor
4	Ground	This pin is connected to ground of the system

- The sensor has Ultrasonic transmitter and receiver
- The Ultrasonic sensor transmits an electronic wave,this wave travels in air and when it gets objected by any material it gets reflected back towards the sensor,this reflected wave is observed by the Ultrasonic receiver module
- Considering the travel time and the speed of the sound you can calculate the distance.
- It measures the distance accurately using a Non-contact technology

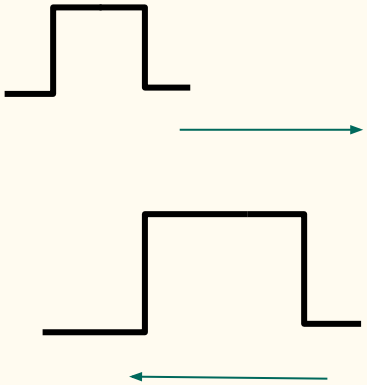




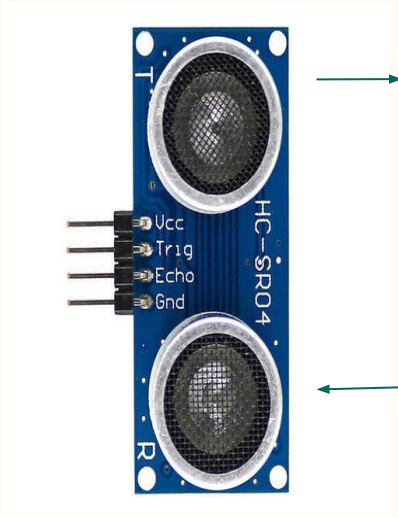
Ultrasonic Communication:

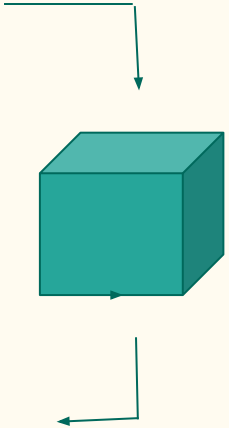


10us to trigger pin



TX





Output echo pin proportional to measured distance

RX

Object

GSM (Global System for Mobile Communications)

A GSM module is a chip or circuit that will be used to establish communication between a mobile device or a computing machine and a GSM system.

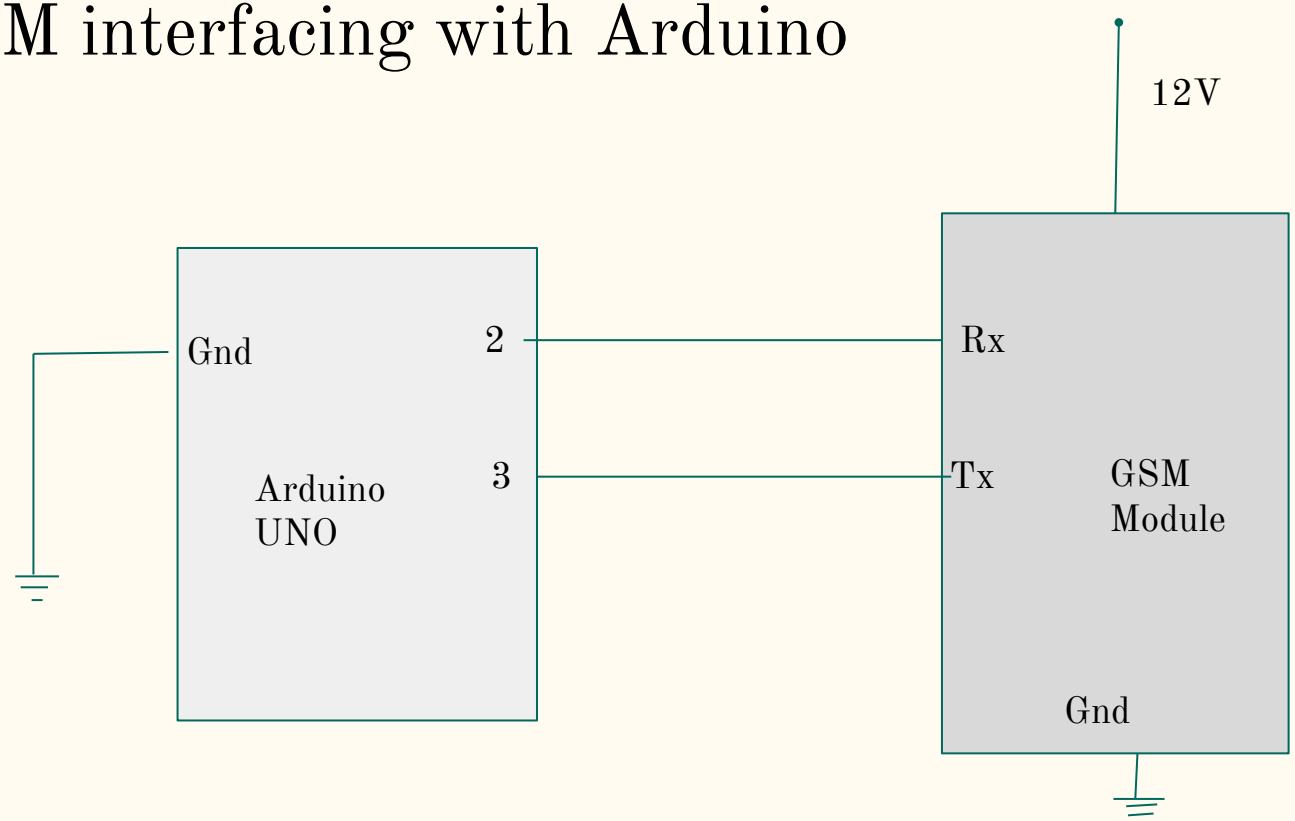
It’s functions include:

1. Read,write and delete SMS
2. Send SMS
3. Monitor the signal strength
4. Monitor the charge status and level of battery
5. Read write and search phone book entries

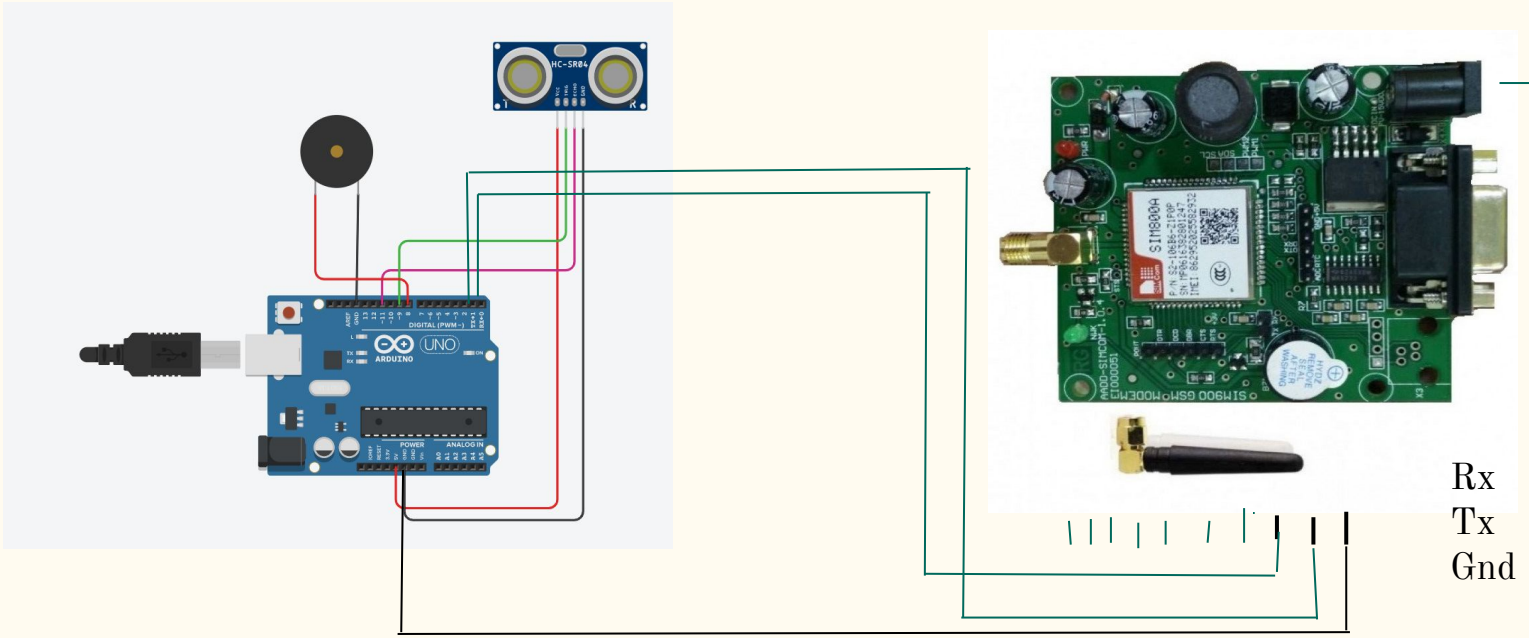
Features:

- Quad band 850/900/1800/1900MHz.
- Input Voltage : 9V-12V DC.
- Low power.
- Control via AT commands High Quality Product
- 5V interface for direct communication with MCU kit.
- Configurable baud rate.
- Built in SIM Card holder.
- Built in Network Status LED.
- Inbuilt Powerful TCP/IP protocol stack for internet data transfer over GPRS.

GSM interfacing with Arduino



CONNECTION DIAGRAM:



Applications:

- Depth measurement
- Burglar Alarms
- Distance measurement
- To detect obstacles
- Non destructive testing
- Humidifiers

Thank you