

# RPi Node-Red: Sonic Sensor (HC-SR04)

## Goal:

Read distance measurements from the sonic sensor within Node-Red

## What You Will Learn:

- Basic Circuit Prototyping
- Basic Node-Red Programming

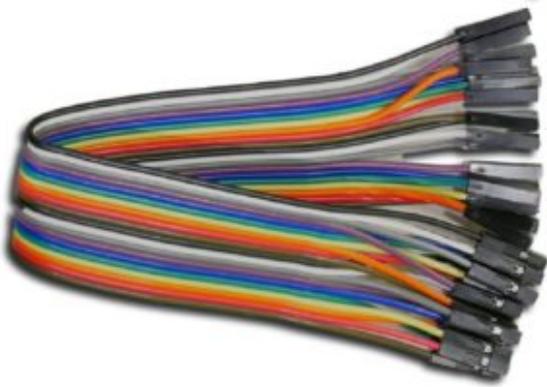
## What You Need to Know:

- [Getting Started with Node-Red](#)
- [In Depth Breadboarding Tutorial](#)

## Parts List:



HC-SR04 Ultrasonic Range  
Finder



4x Female – Female Jumper  
Wires

## What is a Sonic Sensor?

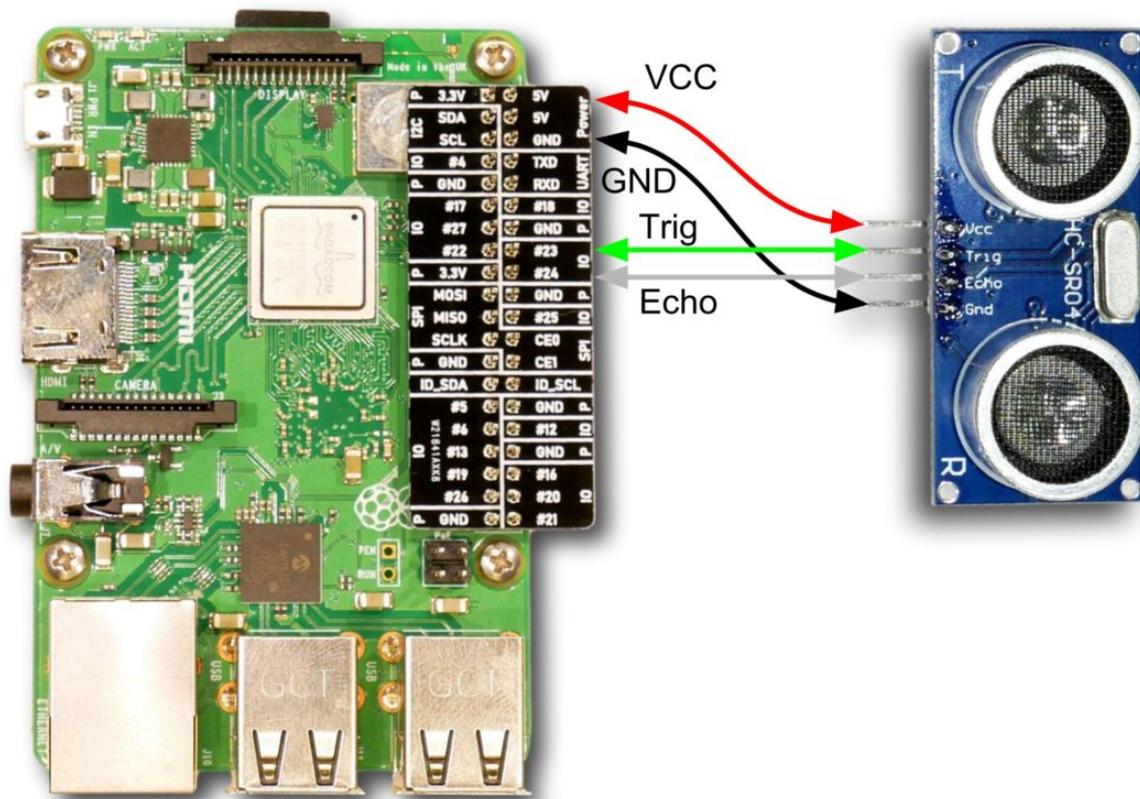
It is a sensor that works based on the principles of echo location. The sensor is able to emit ultrasonic pulses and read ultrasonic pulses, using this timing information along with the speed of sound and some math we can extrapolate distance to the surface the pulses have reflected against.

$$\text{distance} = \frac{(\text{time})(\text{speed of sound})}{2}$$

Thankfully the node we will be using will take care of the math for us.

## Getting Started:

### Setting up the Hardware



I would suggest wiring it exactly as it is in the diagram, using 4 female to female jumper wires to allow you to point the sensor around freely.

## Setting up Node-Red

Start Node-Red and navigate to [127.0.0.1:1880](http://127.0.0.1:1880) using the web browser. Drag the “rpi srf” node and a “debug” node into the flow area.



Double click the “rpi srf” node to open its configuration settings. Set **Pins** to “16,18” (which correspond to GPIO 23,24). The programmer of this node decided that it was better to use the Raspberry Pi’s board pinout rather than the BCM standard, [this](#) web page shows both.

### Edit rpi-srf node

Delete Cancel Done

▼ node properties

● Pins

⌚ Repeat (S)

☰ Topic

📁 Name

**Tip:** Pins MUST be a comma separated list of the 2 GPIO connector pin numbers that are connected to the Trigger and Echo pins of the SRF04 or SRF05.

Next, open the “debug” nodes configuration settings. Check the **debug window** and **node status** options. This will display the last sent message beneath the debug node.

### Edit debug node

Delete Cancel Done

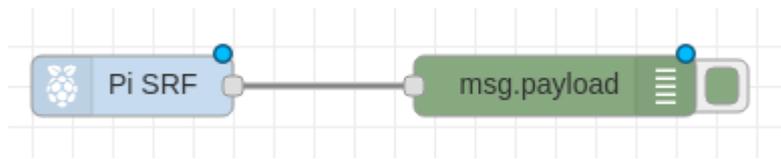
▼ node properties

☰ Output

🔗 To  debug window  
 system console  
 node status (32 characters)

📁 Name

Link the nodes together and deploy the flow.



If everything has gone together properly, you should get numbers appearing below the “debug” node. These are distance measurements in centimeters, you can change the frequency of the measurements within the “rpi srf” node or see the entire measurement history in the debug tab.