



# LESSON B-13

## ACTIVITY #2: ADDING THE IR OBSTACLE SENSOR

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In this activity, you will install the IR Obstacle Sensor and connect its output to the input of channel 1 on the level shifter. You will then test the existing program using the input coming from the new sensor.

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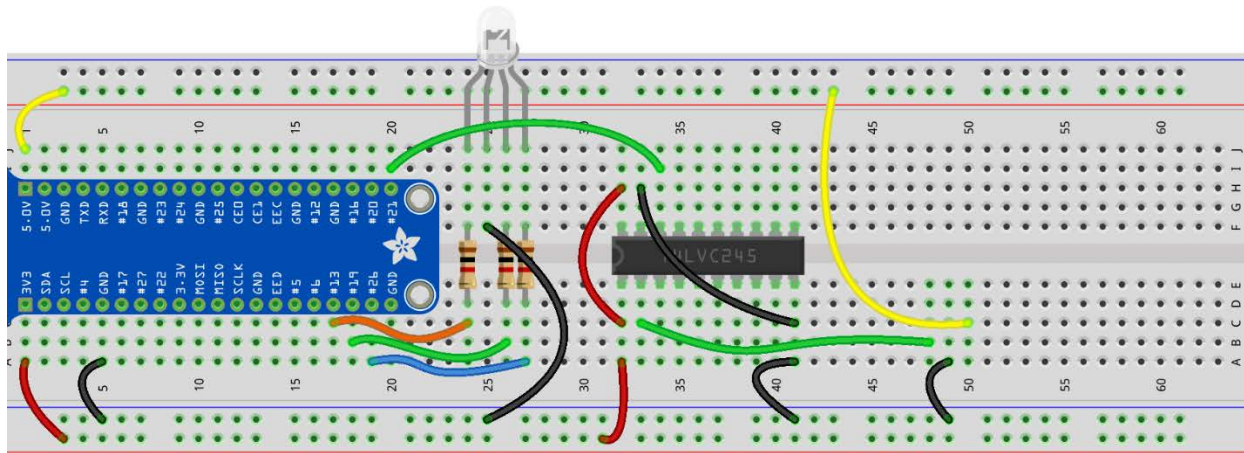
### Step #1

Save your program and shut down your Raspberry Pi so modifications can be made to the circuitry on your breadboard.

## Step #2

The circuitry on the IR Obstacle Sensor will be taking care of sending both high and low signals to the level shifter so the 10K-Ohm pull down resistor on channel 1 is no longer required. Remove the 10K-Ohm resistor between N1-33 and B33. Relocate one end of the channel 1 input jumper wire from P2-37 over to B48. This will be used to connect to the output of the new sensor.

The obstacle sensor will need 5V power and ground connections. For ground, add a short jumper wire between N1-49 and A49. To supply 5V, connect a long jumper wire between C50 and P2-43. Your breadboard will now look like this:



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## Step #3

You're now ready to install the IR Obstacle Sensor.

It's critical that the sensor is installed the correct direction, as reversing it could cause damage to the sensor or your Pi.

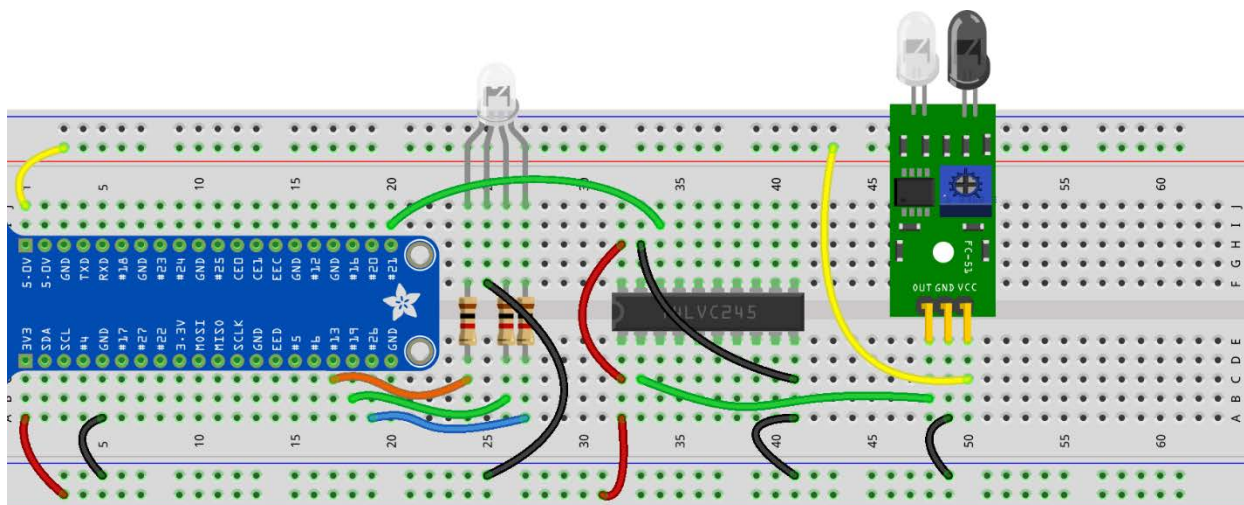
The pins on the sensor are labeled OUT, GND, and VCC, from left to right. You will notice that the previous step had you connect rows 48, 49, and 50 so those signals are available for the sensor

Check the markings directly above the pins on the sensor, and insert the sensor into the breadboard in column E so that:

OUT is in E48

GND is in E49

VCC is in E50



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## Step #4

Power up your Pi and run the program you saved during the last activity. Instead of manually moving a jumper wire to simulate high and low, the IR Obstacle sensor will now be supplying high and low signals based on whether an obstacle is detected.

- If no obstacle is detected, the sensor output will be low, and the LED will remain green
- If an obstacle is detected, the sensor output will switch to high, and the LED will turn red.

Simulate an object by lowering a piece of paper in front of the sensor. At some point around 3 to 5 cm your object will be detected by the sensor, and the LED will change state. Your hand may work to trigger the sensor, but the human body is not a very good reflector of infrared waves, so your hand may need to be even closer to trigger the sensor.

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## Step #5

Power down your Pi in preparation for the next activity where you will add the Infrared line sensor to the circuit.