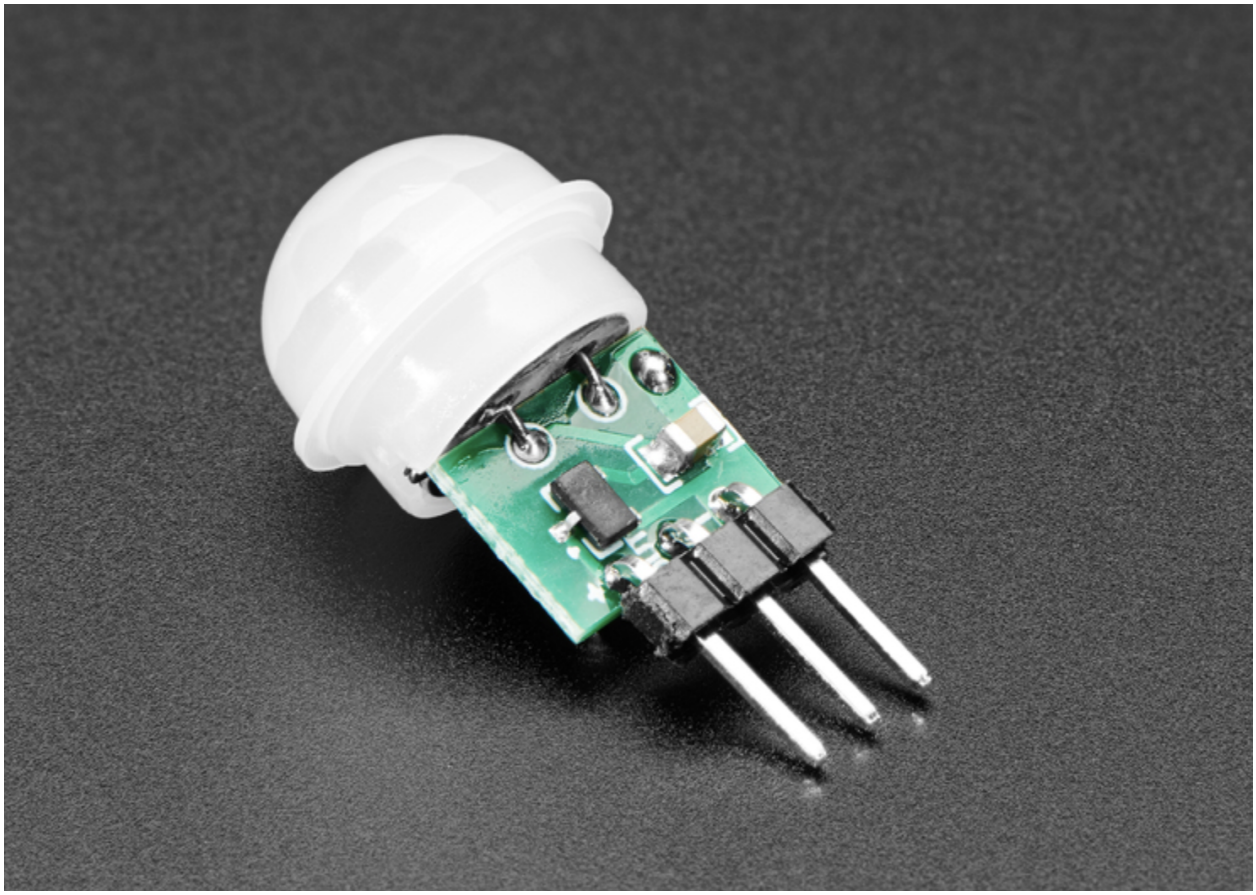
# CMPT 433

# How to connect PIR MotionSensor to BeagleBone Green via A2D



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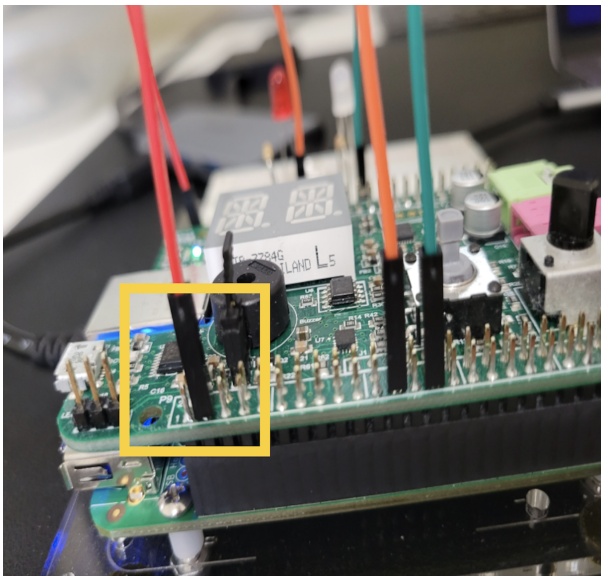
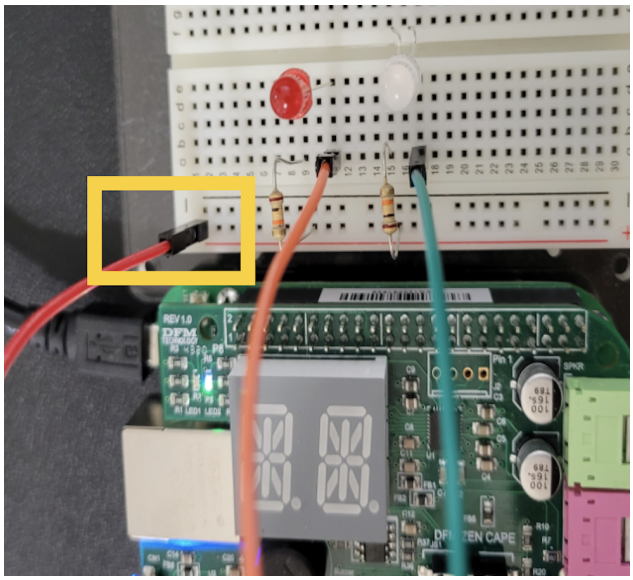
**Prerequisites:**

1. You will need 4 wires (female/male)
2. You will need 2 resistors
3. You will need the Adafruit 3 pin motion sensor (https://www.adafruit.com/product/4871)

**Wiring the 3 PIN PIR MotionSensor to the BeagleBone Green:**

1. Get the first wire we will call this the power wire. Connect this power wire to PIN3 on the P9 header and connect the other side to the breadboard as shown below in the picture on the right.



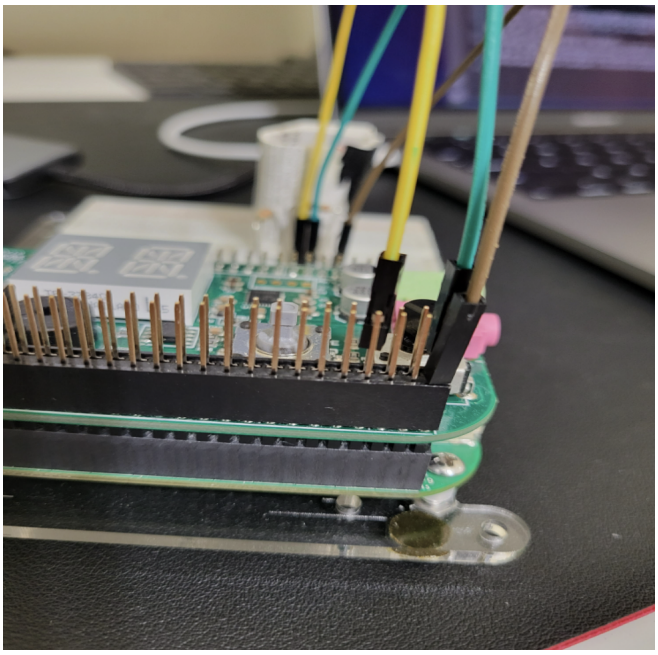


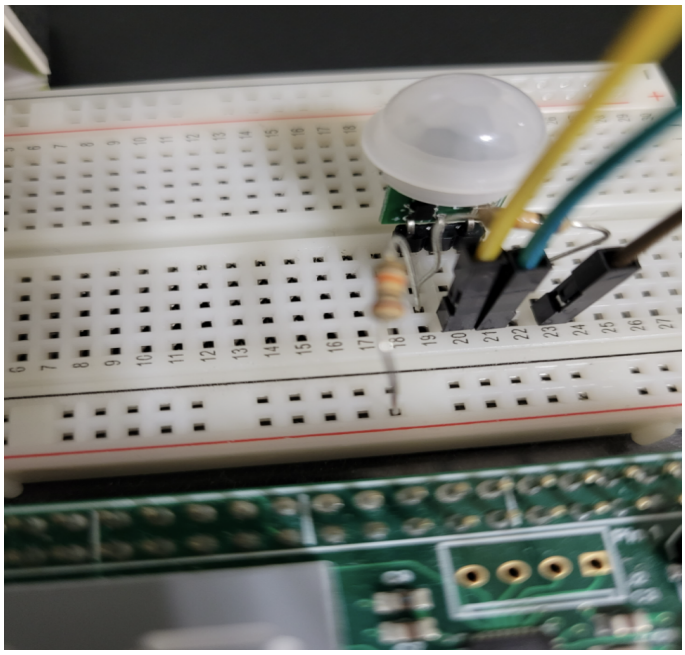
2. Have the second wire connected to GPIO PIN40 on the P9 header. This pin is where the motion sensor output will be sent to via A2D.

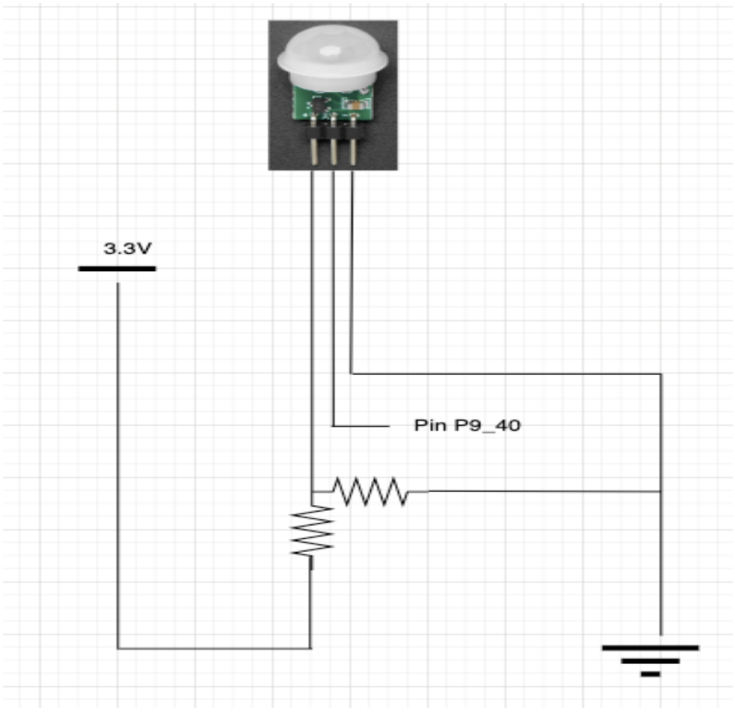
3. Have the last two wires connect to the ground. We used GPIO PIN 45 and GPIO PIN 46 for ground.

4. The motion sensor has 3 pins to it. The first pin is where the 2 resistors should meet, this motion sensor pin is for the power. The second motion sensor pin is where the output wire (yellow) is connected to. The third

motion sensor pin is for grounding the motion sensor where the second wire (green) is connected to ground. The last wire (brown) is where the second resisitor's end point is which also connects to ground. We are effectively creating a voltage divider to half the current flowing into the A2D to not fry it. The pictures and diagram below should show how to do the wiring.







**Reading the Motion Sensor voltage output on the BeagleBone Green:**

*All of these commands are on the target*

1) Change directories into the A2D directory:
   *cd /sys/bus/iio/devices/iio:device0/*

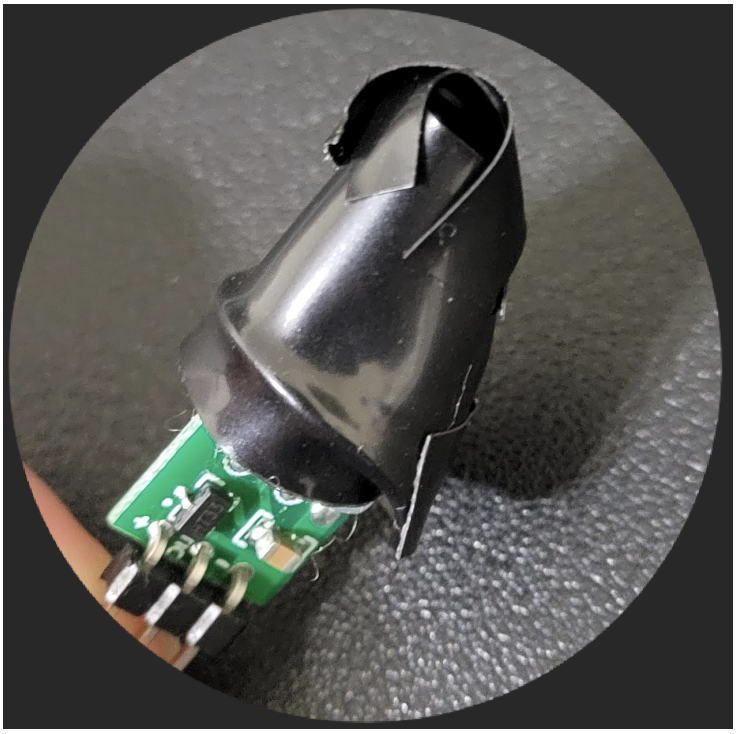
2) Do not hover your hand over the motion sensor and read the value of the voltage with the following command:
   *cat in_voltage0_raw*
   This value will be 0 as there hasn't been any movement

3) Hover your hand over the motion sensor and quickly read the value of the voltage with the same command as above:
   *cat in_voltage0_raw*
   This value will be around 3700 as movement has been detected
   and the value will fall back to 0 after two seconds of the motion sensor detecting movement

4) To read the value using a C program, refer to the A2D guide (section 4: A2D Guide)

**Troubleshooting:**

Our Motion Sensor was really sensitive so what we did to overcome this was to wrap our motion sensor with electrical tape and leave a small hole at the top for the motion sensor to detect movement. Here is an image of what we did:



**References:**

https://www.adafruit.com/product/4871