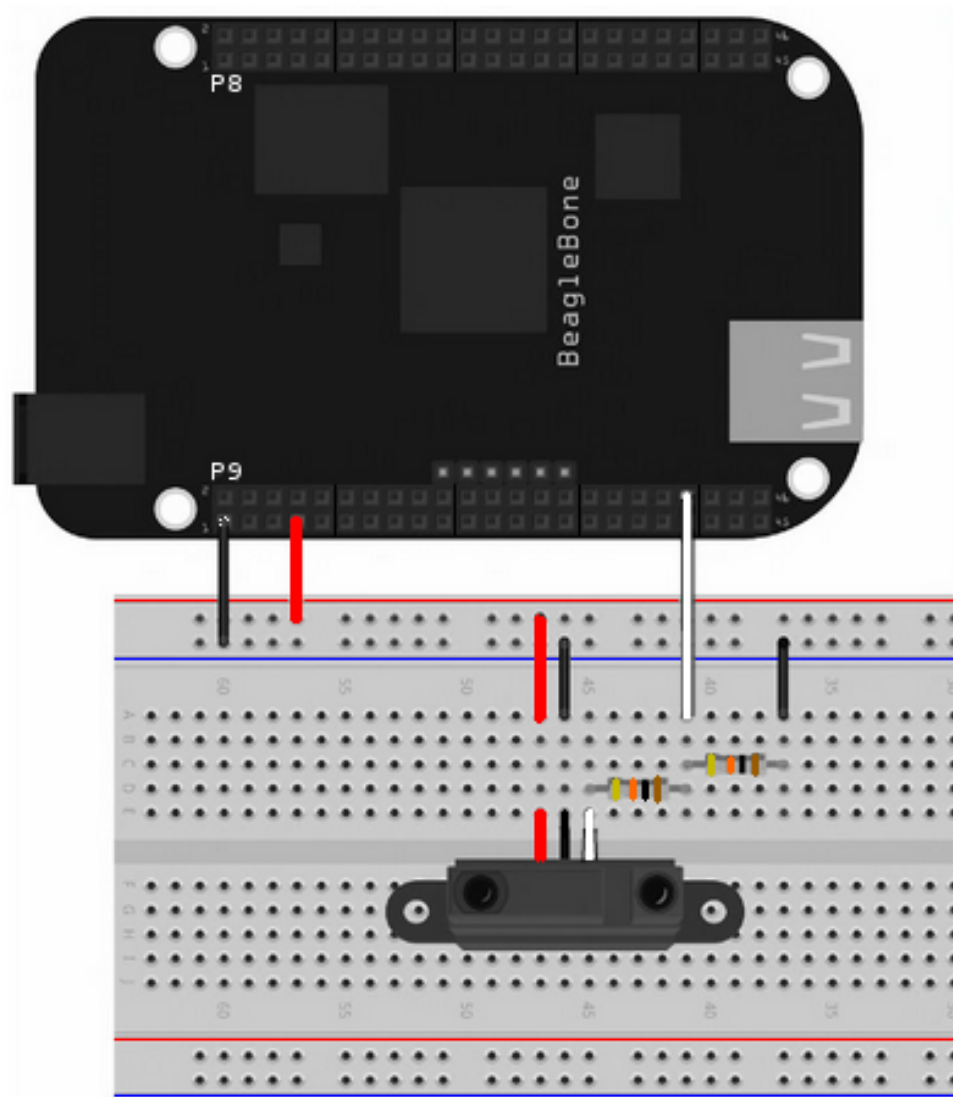# Infrared Distance Sensor Guide by group XATM

This guide covers the installation and usage of the Sharp GP2Y0A21YK infrared distance sensor.

1. Wiring

1. Ensure the BeagleBone and the ZenCape are power off before plugging in any electronic devices.

2. Plug the IR sensor onto the ZenCape with jumper cables according to the following schematic:

Illustration 1: Schematic for plugging in the IR distance sensor to the BeagleBone.

Make sure that the circuit effectively follows this exact schematic! Have someone check your circuit before you plug any power into the board.

Black wire from the IR sensor should connect to pin P9-01, Red wire to P9-07, and White wire to P9-40.

Both resistors are 10kOhm resistors, color coded Brown Black Orange Gold on the resistors themselves. Orientation of resistors do not matter.

Illustration 2: Appearance of the 10kOhm resistors, for the resistor illiterate.

2. Data access

Similar to the ZenCape's built-in potentiometer, data from the infrared distance sensor is gathered via A2D. As such, many of the procedures shown from here on will be identical to those in the course's A2D guide. Pin P9-40 corresponds to the AIN1 slot of the BeagleBone, as shown in the A2D guide.

1. Enable the A2D Linux functionality by turning on the ADC virtual cape:

```
# echo BB-ADC > /sys/devices/platform/bone_capemgr/slots
```

2. Change to the sysfs directory:

```
# cd /sys/bus/iio/devices/iio\:device0
```

3.   Since the distance censor is wired to AIN1, to read the distance sensor voltage we must check the contents of the in_voltage1_raw file:
```
# cat in_voltage1_raw
```
Access via C code can be achieved with the C code provided in the A2C guide by adding in:

> **#define** A2D_FILE_VOLTAGE1 "/sys/bus/iio/devices/iio:device0/in_voltage1_raw"

Then replacing all mentions of A2D_FILE_VOLTAGE0 with A2D_FILE_VOLTAGE1. Some fine tuning may be required to get more accurate data.

References:

Illustration 1 source:
https://books.google.ca/books?id=1_cwBgAAQBAJ&pg=PA207&source=gbs_selected_pages&cad=3#v=onepage&q&f=false