

External Components

ADC Ultrasonic Proximity Sensor

```
#include "adc0.h"
int main(void)
{
    int reading = 0;
    // Initialization :
    LPC_PINCON->PINSEL3 |= (3 << 28); // ADC-4 is on P1.30, select this as ADC0.4
    while (1)
    {
        reading = adc0_get_reading(4); // Read current value of ADC-4
        printf("\nADC Reading: %d", reading);
        delay_ms(1000);
    }
    return 0;}
```

Buzzer

A buzzer needs a PWM to operate, or you can operate it using a GPIO but it can waste your CPU cycles. Before you start with the code, attach a GPIO or PWM pin to a 1K resistor leading to the buzzer's red wire. The black wire should be connected to ground.

```
#include "gpio.hpp"
#include "utilities.h"
int main(void)
{
    /* Assume we attached our P1.20 to the buzzer */
    GPIO buzzer(P1_20); /* Use P1.20 as General Purpose Input/Output (GPIO) */
    buzzer.setAsOutput(); /* Use this pin as OUTPUT */
```

```

while (1)
{
  /* Beep for one second */
  for (int i = 0; i < 1000; i += 2)
  {
    delay_ms(1);
    buzzer.setHigh();
    delay_ms(1);
    buzzer.setLow();
  }
}

```

Motion Sensor

A typical motion sensor like a PIR motion sensor is very easy to attach. Power-up the sensor using 5v, and connect the ground. Then take a resistor, tie one end to 5v, and the other end to the motion's signal. Finally, tie the signal to one of your GPIOs.

```

#include "gpio.hpp"
#include "utilities.h"
int main(void)
{
  /* Assume we attached our P1.20 to out motion sensor's output pin */
  GPIO motion(P1_20); /* Use P1.20 as General Purpose Input/Output (GPIO) */
  motion.setAsInput();
  motion.enablePullUp();
  while (1)
  {
    /* Get average of one second */
    int count = 0;
    for (int i = 0; i < 1000; i++)
    {
      /* If output is low, then motion has been detected, but it could be false positive */
      if (!motion.read())
      {
        count++;
      }
    }
  }
}

```

```
    delay_ms(1);  
}  
/* Test and calibrate yourself: */  
bool motionDetected = (count > 50);  
}
```

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Created 2 years ago by [Khalil Estell](#)

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