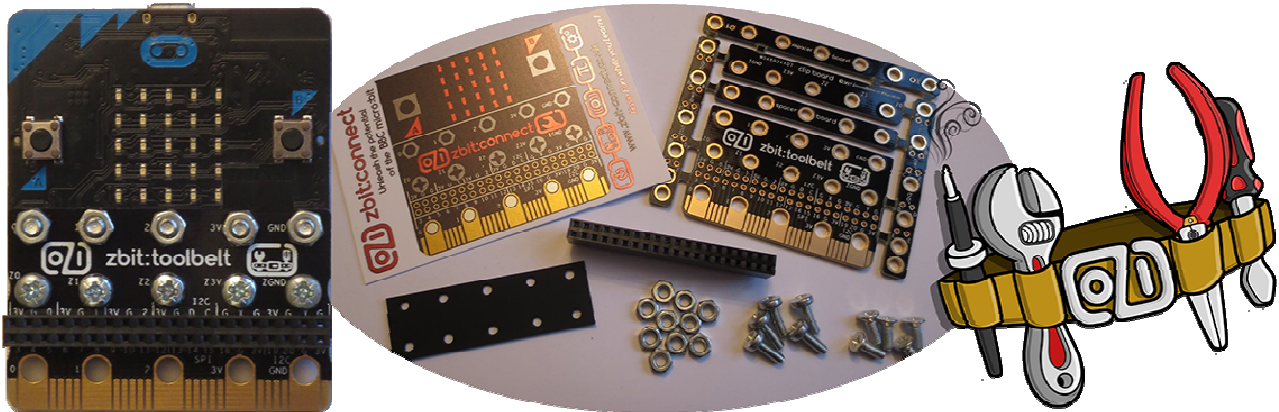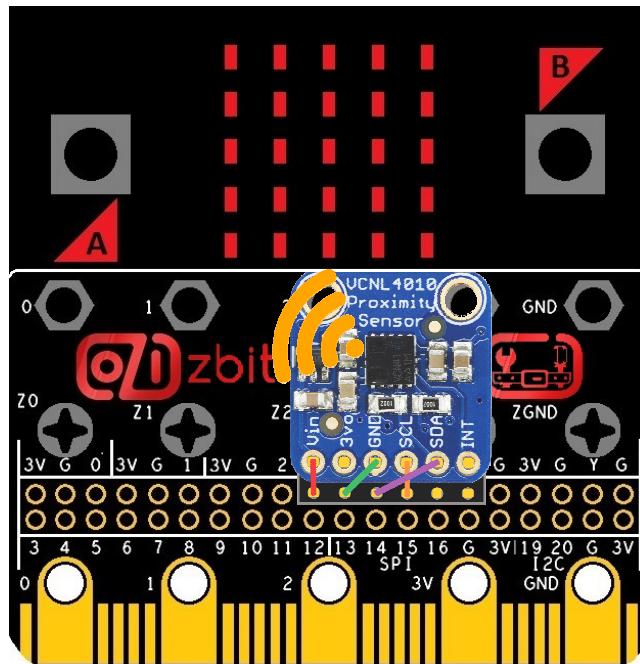# zbit:toolbelt

for the BBC micro:bit

Example T3 – Adafruit Proximity Sensor on zbit:toolbelt

This zbit:toolbelt example shows you how to plug the Adafruit VCNL4010 Proximity Sensor into zbit:toolbelt and use it to display the proximity of a object as a bar graph on your micro:bit display and make a **Proximity Controlled Musical Instrument***!*

Parts required

1 x zbit:toolbelt
1 x zbit:connector (see page 2 for details)
1 x Adafruit Proximity Sensor Product Code 466
1 x Dual Row 6+6 pin 0.1" Header Strip
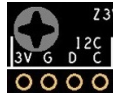4 x Link Wires
1 x BBC micro:bit !!!
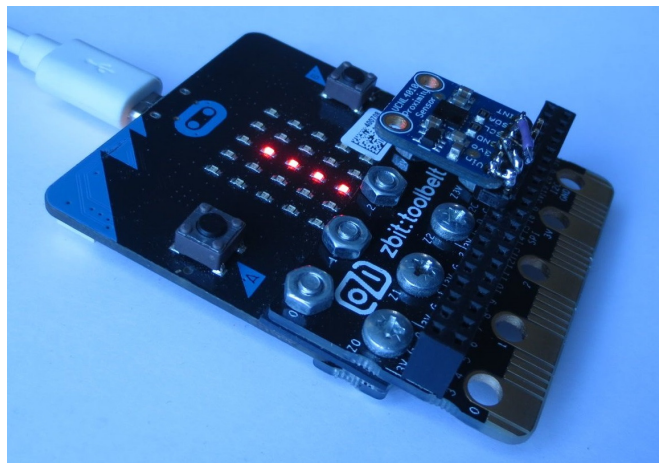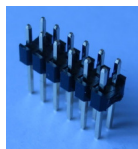
Adafruit Proximity (& Light) Sensor Features

The Adafruit Proximity Sensor Breakout Board (Product ID:466) is based on the VCNL4010 Vishay Semiconductors Proximity IC which uses Infra Red light to sense the proximity of objects up to a distance of about 200mm (8 inches) away - Ideal for Robotics! (The IC also includes an Ambient Light Level Sensor -See Adafruit Design Guide on **www.Adafriut.com** for more details). It interfaces to the **micro:bit** using **I2C** with the following connections:-
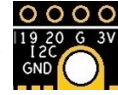
Connect **3V** to the sensor's **Vin** pin, **GND** to the **GND** pin, **P19** (or **C**) to the **SCL** pin and **P20** (or **D**) to the **SDA** pin.

Wiring the Adafruit Proximity Sensor ready to plug into zbit:toolbelt

zbit:toolbelt can accommodate **up to two I2C boards** one top centre of the zbit:toolbelt connector and one bottom right.
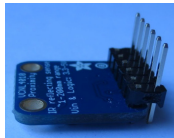
Both use the **I2C** pinout **3V, GND, SDA(P20), SCL(P19)**. The Adafruit Proximity Sensor uses a different pinout so must be adapted to fit on zbit:toolbelt. The adaptor consists of a Dual Row 6+6 pin 0.1" Header Strip and 4 x Link Wires.
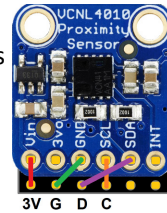
1) Solder the Dual Row 6+6 pin 0.1" Header Strip to the Adafruit Board

2) Cut the inner row of Header Pins below the plastic strip using Wire Cutters

3) Solder the 4 Wire Links (Red, Green, Orange & Purple) from the signals on the inner row to the outer row pins as shown

Adafruit pins **3vo** and **INT** are left unconnected

Plugging the Adafruit Proximity Sensor into zbit:toolbelt

Plug the **Adafruit Proximity Sensor** into **zbit:toolbelt** in either of the two locations shown below. *Ensure that the Vin pin on the sensors board is aligned with the 3V pin on zbit:toolbelt!*
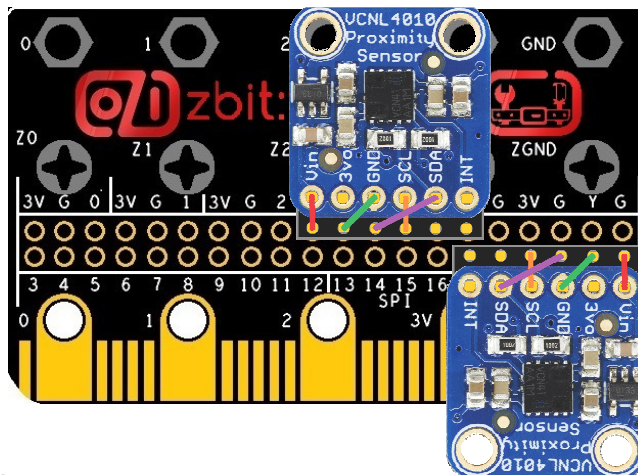
Python Example Code

A Python example program to drive the **Adafruit Proximity Sensor** can be downloaded from www.zbit-connect.co.uk The example code displays the proximity as a Bar Graph on the **micro:bit** display. The nearer the object the more LED's are 'on'. It also uses the proximity data to set the frequency of a musical note, output on **micro:bit P0**. So, **connect up a speaker to P0** and you'll have a **Proximity Controlled Musical Instrument!**

For this project the use of the zbit:connector...

...is *essential* as it connects to **'small pads'** GPIO **P19** & **P20** See **'zbit:connect family guide'** for more details

For updates follow Twitter @ZbitConnect

Have Fun while you Learn!

www.zbit-connect.co.uk