



zbit:thumb



analogue joystick
for the BBC micro:bit



Have Fun while you Learn !

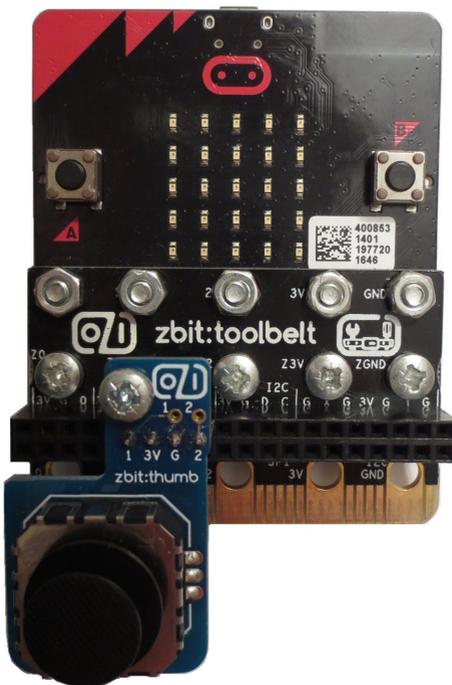


www.zbit-connect.co.uk

zbit:thumb - analog joystick for the BBC micro:bit

zbit:thumb is a member of the **zbit:connect** family of add-on boards for the **BBC micro:bit** brought to you by *innovations in education*.

zbit:thumb is designed to plug into one of the main **zbit:connect** boards such as **zbit:toolbelt** allowing you to control your **micro:bit** with a **2 axis analog joystick!**



These smaller boards that fit on one of the the main **zbit:connect** boards are known as '**zbit:toolkit**' boards, designed to *unleash the potential of the BBC micro:bit*

'Have Fun while you Learn'

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zbit:thumb features

zbit:thumb provides the smallest, lightest and most compact way to plug a 2 axis analogue joystick onto your **micro:bit**

This is possible due to the *unique* way **zbit:thumb** attaches to **zbit:connect** boards

zbit:thumb connects to GPIO P1, P2, 3V and GND on the **zbit:connect** board's Top Row Header and is bolted in place to the Z1 hole

zbit:thumb uses an **Adafruit Mini 2-Axis Analog Thumbstick 2765**

The joystick acts a a pair of 4.7kohm ohm potentiometers, one for the x-axis and one for the y-axis, connected between 3V and GND.

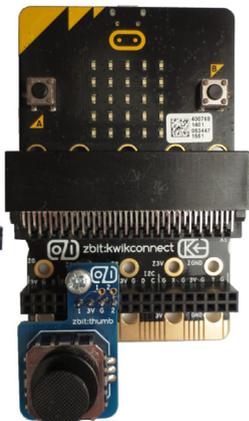
When connected to the **micro:bit**, the voltage on GPIO **P1** gives the **x-axis** position and the voltage on GPIO **P2** gives the **y-axis** position

zbit:thumb is compatible with...

zbit:toolbelt



zbit:kwikconnect



zbit:speaker



zbit:builder



and other 'full sized' **zbit:connect** boards
(It is *not* compatible with **zbit:PiDapter**)

With a bit of *hacking* it is even possible to fit **two zbit:thumb** joysticks on **zbit:toolbelt** or **zbit:kwikconnect** at the same time

See www.zbit-connect.co.uk for details

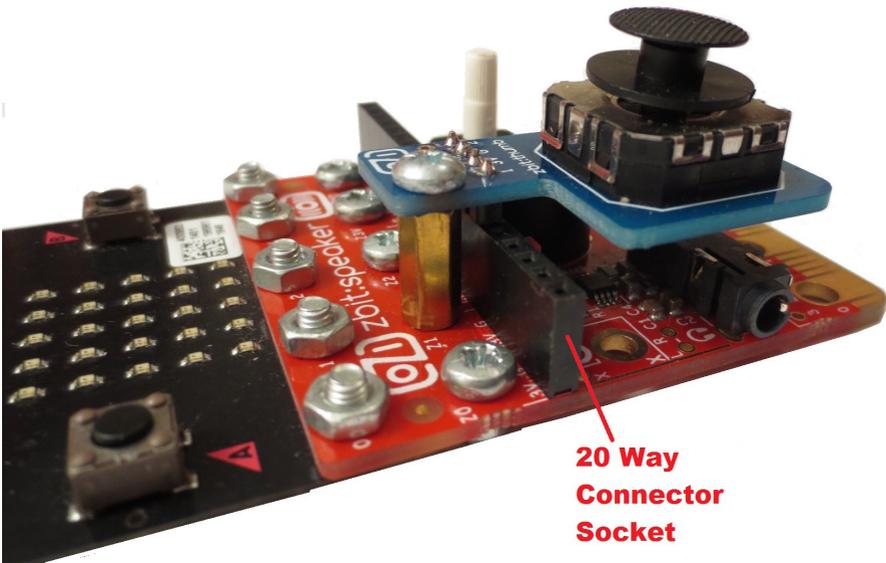
Contents

- 1 x zbit:thumb board
- 1 x joystick
- 1 x 4 pin header
- 1 x 11mm threaded spacer
- 2 x M3x6mm Panel Head Screws

Tools Required

- Pozidrive Screwdriver
- Soldering Iron
- Solder

To fit **zbit:thumb** onto **zbit:speaker** or **zbit:builder** a 20 way single row socket connector such as the Harwin M20-7822046 is required, ***but is not included*** - It must be soldered to the **Top Row Header** - See picture below



Assembly Instructions

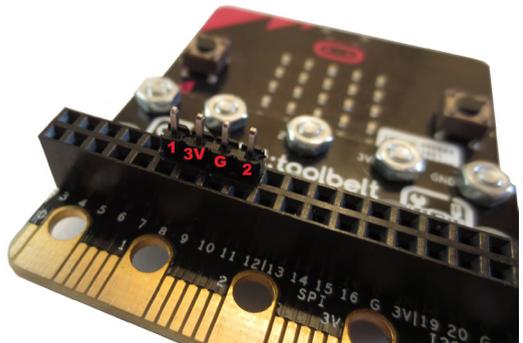
zbit:thumb plugs into the Top Row of the 40 way connector on **zbit:toolbelt** or **zbit:kwikconnect**. It can also plug into a 20 way Top Row Header Connector if fitted to other **zbit:connect** boards such as **zbit:speaker** or **zbit:builder**

1) Fit the joystick on the top of the PCB ensuring that the 2 plastic pins on the bottom of the joystick fit into the 2 holes in the PCB so the body of the joystick is flush with the top surface of the PCB

2) Solder the joystick pins

3) *If using **zbit:speaker** or **zbit:builder**, fit a 20 way Single Row Socket Connector into the Top Row Header (See photo on previous page)*

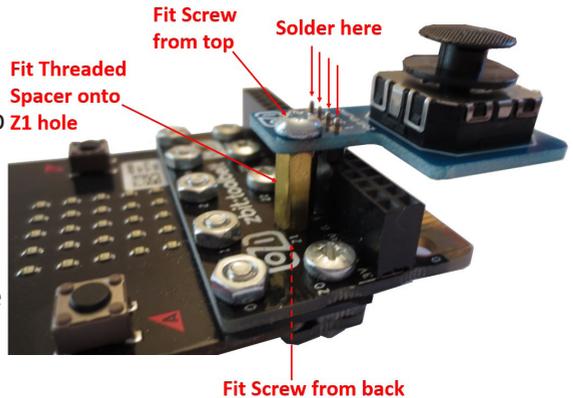
4) Insert the 4 pin Header with long pins facing down into signal pins P1,3V,G,P2 of the Top Row Header on the **zbit:connect** board



5) Remove the M3x8mm Panel Head Screw from **zbit:connect** board Z1 hole

6) Insert the M3x8mm Panel Head Screw into hole Z1 from the back of the board (if the Clip Board and Spacer Board are *not* fitted, use the M3x6mm Panel Head Screw instead)

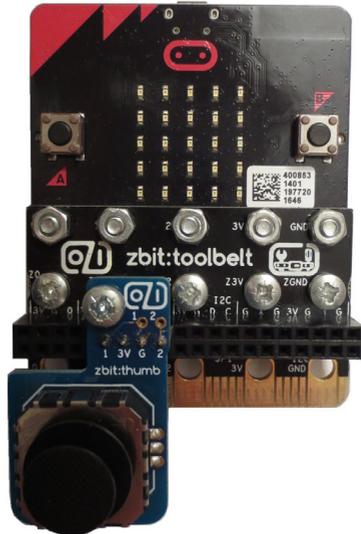
7) Fit the zbit:thumb PCB on the 4 pin Header pins and secure it to the threaded spacer using a M3x6mm Panel Head Screw



8) Solder the 4 Header pins

9) *If using **zbit:speaker** or **zbit:builder**,* solder the 20 way Single Row Socket Connector pins

zbit:thumb is now ready to use !



Visit www.zbit-connect.co.uk for test programs and examples of what you can do with **zbit:thumb** !

zbit:thumb test software code

zbit:thumb can be used with software code written in any of the programming languages available for the **micro:bit** – **Block**, **Touch**, **JavaScript** or **Python**. This example code uses **Block** which is the easiest of the programming languages and will allow you to quickly confirm that your **zbit:thumb** is working correctly.

```
on start
  set x to 0
  set y to 0

forever
  clear screen
  set x to (map (analog read pin P1)
    from low 100
    from high 900
    to low 4
    to high 0)
  set y to (map (analog read pin P2)
    from low 100
    from high 900
    to low 4
    to high 0)
  if (x > 4) then set x to 4
  if (x < 0) then set x to 0
  if (y > 4) then set y to 4
  if (y < 0) then set y to 0
  plot x (x) y (y)
```

Understanding zbit:thumb's Analogue Joystick

The potentiometers in the **JoyStick** act as 'potential dividers' meaning that they divide down the input voltage (3 Volts) depending upon the position of the 'wiper'. The output of the 'wiper' is then connected to the **micro:bit's** GPIO.

The diagram below shows the approximate voltage on the GPIO **P1** and **P2** when the **JoyStick** is **up, down, left, right** and **centre**. It also gives the approximate **analog input** value read by your code when using the 'Analog Read Pin' command.

