Getting started with your Starter Maker PCB

Required components summary:

1x printed circuit board (PCB)	1x tactile button
1x red LED	1x passive buzzer
1x amber LED	1x 1rowx6P male black header
1x green LED	3x 470Ω resistors
3x 3D printed PCB feet + 3x 6mm M2 self tap screws	6x 10cm or 20cm female-to-female Dupont jumper leads

The aim of this project is to provide access to an expanding library of example code to allow a digital maker to 'get started' with exploring and controlling many different components and devices. This is achieved by using this custom PCB to assemble a small populated module that can connect to any of the family of Raspberry Pi single board computers (SBCs) or to a number of different microcontrollers like the Raspberry Pi Pico.

Example software is available to download for Raspberry Pi SBCs and several microcontrollers along with an overall "*Starter Maker PCB Usage Documentation*" PDF and other support documents.

If a Raspberry Pi is to be used, any model is OK, but if a new Pi is being purchased the Raspberry Pi 5 with at least 2GB of memory is recommended as well as a SD card that is at least 32GB. You should also be using the latest Bookworm version of the operating system – if you have an earlier operating system version, you should carry out an update or create/install a new SD card before installing the Raspberry Pi software and documentation for the use of this Starter Maker PCB.

If one of the suggested microcontrollers is being used a separate computer is needed to run either the Arduino or Thonny IDEs and as these IDEs can be installed on a variety of machines (Windows PC, Mac, Raspberry Pi etc.,) the microcontroller code examples are provided as .ZIP file downloads as follows:

Raspberry Pi Pico - *MicroPython for electronic basics*:
https://onlinedevices.org.uk/dl1421 where the last set of characters are lower case DL1421

Raspberry Pi Pico - *C/C++ for electronic basics*:
https://onlinedevices.org.uk/dl1427 where the last set of characters are lower case DL1427

ESP32 - *C/C++ for electronic basics*: **https://onlinedevices.org.uk/dl1422** where the last set of characters are lower case DL1422

ESP8266 - *C/C++ for electronic basics*:
https://onlinedevices.org.uk/dl1423 where the last set of characters are lower case DL1423

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***Raspberry Pi SBC - Scratch + Python code for electronic basics*:** To get started with a Raspberry Pi, you need to set up and configure your Pi with a screen, keyboard plus mouse and connect it to the internet, but this is not covered here as other publicly available resources can help you do this.

With your Raspberry Pi started in 'Desktop' mode and connected to the Internet, a usage document (PDF) for the PCB as well as other support documents and all the software for each project and method can be downloaded to your Raspberry Pi by running the following commands in an opened 'Terminal' window.

N.B. the $ sign in the command lines below signifies the prompt character in your terminal application, which you do not need to type.

First run the following command to download an initial control script where you substitute your username for YOURUSERNAME:

$ wget -O /home/YOURUSERNAME/starter_kit1_ePi.sh https://onlinedevices.org.uk/dl1428

(take great care to type this correctly and if you get an error then recheck it)
-O above is an upper case letter O and the last set of characters are lower case DL1428

You then run the following two commands to prepare and run the downloaded control script which when run, will then download all the files and store them on your Raspberry Pi in a main folder and various subfolders starting at */home/YOURUSERNAME/starter_maker_kit1/RPi_code*

```
$ chmod +x starter_kit1_ePi.sh
$ ./starter_kit1_ePi.sh
```

The downloaded documentation files provide you with very detailed information on the electronic basics usage with the PCB

***Raspberry Pi SBC - Python code for image taking*:**

For the additional Image Taking example software, in a similar way to that described above run the following command to download another control script:

$ wget -O /home/YOURUSERNAME/starter_kit1_imgPi.sh https://onlinedevices.org.uk/dl1430

(take great care to type this correctly and if you get an error then recheck it)
-O above is an upper case letter O and the last set of characters are lower case DL1430

You then run the following two commands to download more material:

```
$ chmod +x starter_kit1_imgPi.sh
$ ./starter_kit1_imgPi.sh
```

For each of the projects/methods described in the main documentation for the Raspberry Pi you should ensure that the Pi is <u>not</u> powered when connecting the PCB to the Raspberry Pi.

With some adult help, this Starter Maker project is aimed at ages 10 and above, although with an adult carrying out the soldering of components onto the PCB, ages as young as 7 should be able to run the projects, although at this early age not all the physics and maths associated with the projects may be fully understood.