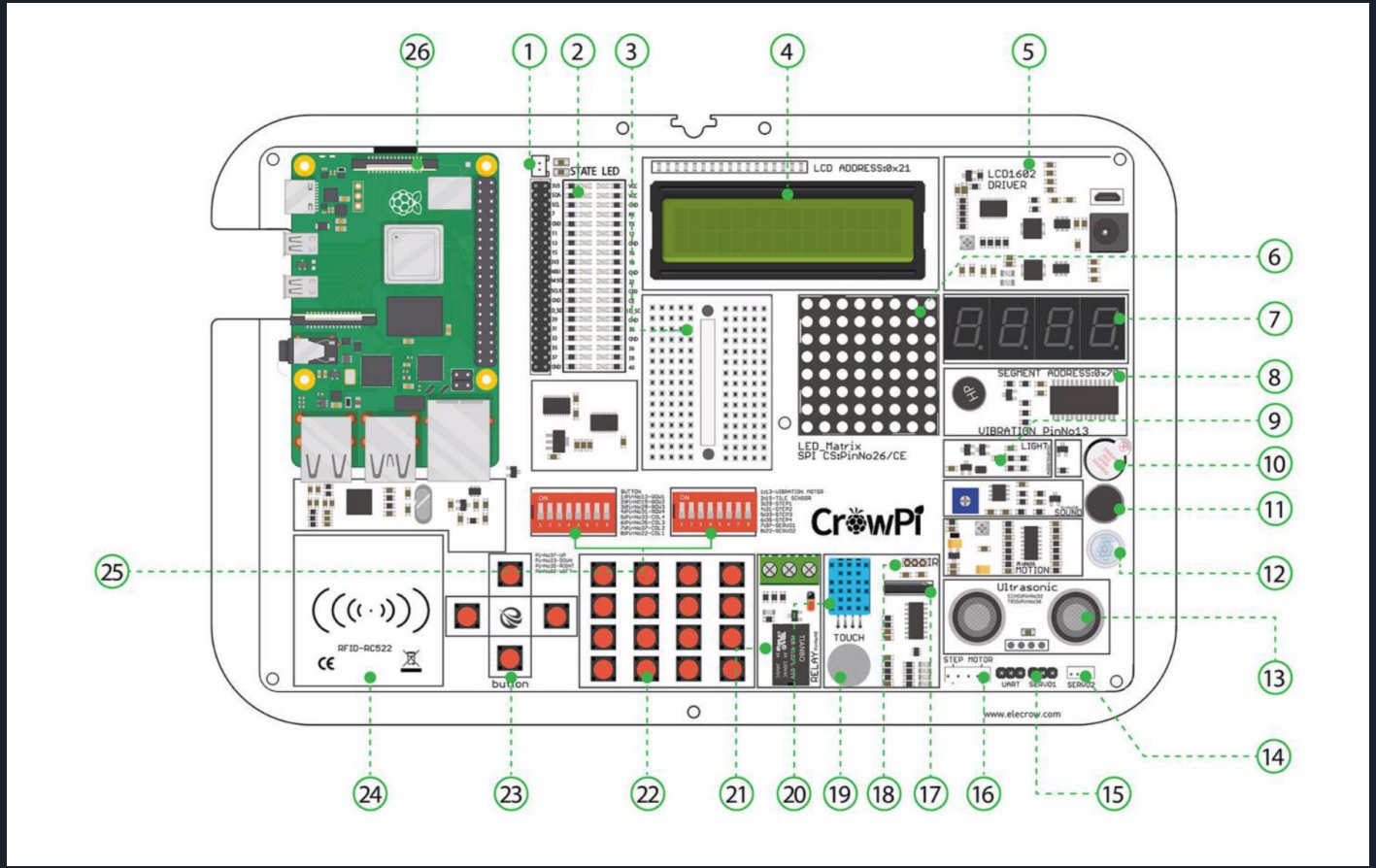
Getting Started with the Crowpi Raspberry 4 All-in-one Kit

Spring IST 440W Capstone Project

Introduction to the Crowpi Raspberry Pi Kit



Locations and functions of the kit's modules

* 1 - 2-pin fan interface, the upper pin is "+" and the lower pin is "-"
* 2 - GPIO LED Indicator
* 3 - Breadboard - Used to make custom circuits using outside modules which the CrowPi doesn't include
* 4 - LCD Module - Used to show multi line information and text
* 5 - Power Circuit
* 6 - Matrix LED - Used to show text and other sorts of data
* 7 - Segment LED - Used to show numbers and data

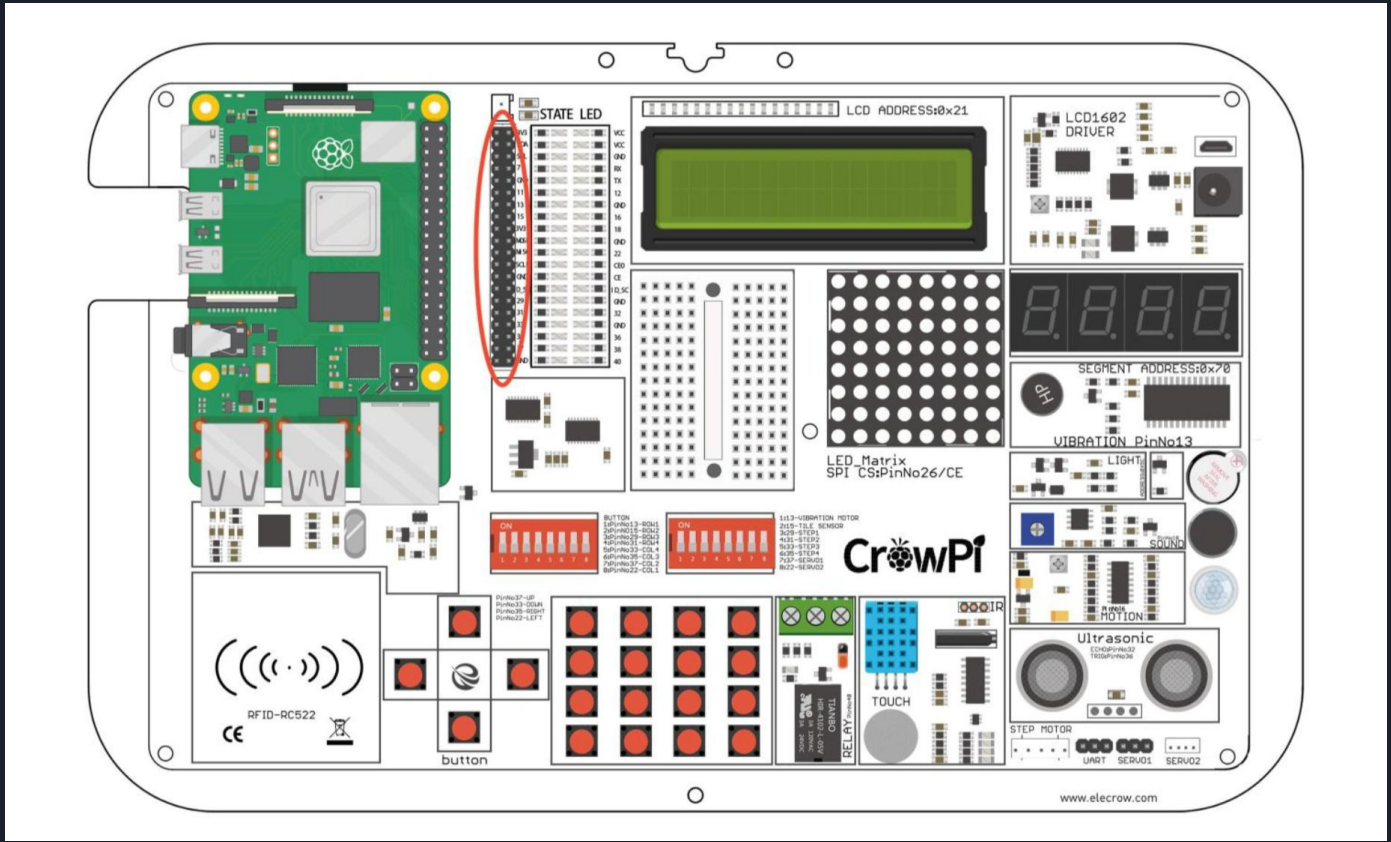
Locations and functions of the kit's modules Pt.2

* 8 - Vibration module - Used to make a strong vibration throughout the CrowPi board
* 9 - Light sensor - Used to detect and measure the strength of the light in the room
* 10 - Buzzer - Used to make a really loud buzzing alarm!
* 11 - Sound Sensor - Used to detect loud noise in the room
* 12 - Motion sensor - Used to detect motion in the room and around the CrowPi
* 13 - Ultrasonic sensor - Used to measure distance between the sensor and an object on top of it!
* 14,15 - Servos interface-2 interfaces to connect servos and be able to rotate them in any direction you want!

Locations and functions of the kit's modules Pt.3

* 16 - Step motor - Used to control robots and machines in the industry, learn how to make step movements using this module!
* 17 - Tilt Sensor - Used to detect a tilt in the CrowPi; whenever you tilt it to the right or to the left, you'll know!
* 18 - IR Sensor - Used to send and receive IR signals; also able to copy them and transmit them back!
* 19 - Touch Sensor - Works like a button but instead of clicking it detects touch!
* 20 - DH11 Sensor - Used to check and measure the humidity and the temperature in the room!
* 21 - Relay - Used to open and close electronic circuits to control electronics such as LED's!
* 22 - Matrix Buttons - Can be used as a keypad or as multiple options buttons!
* 23 - Independent buttons - Can be used to play games or control a robot!
* 24 - RFID Module - Used to Read and Write data over RFID/NFC cards!
* 25 - Switches - Used to switch between the sensors and modules as the Raspberry Pi doesn't contain enough GPIO pins
* 26 - Raspberry Pi

The GPIO Pin out



The GPIO Pinout PT.2

GPIO Schemes

There are 2 possible Raspberry Pi GPIO Scheme: GPIO.BOARD and GPIO.BCM

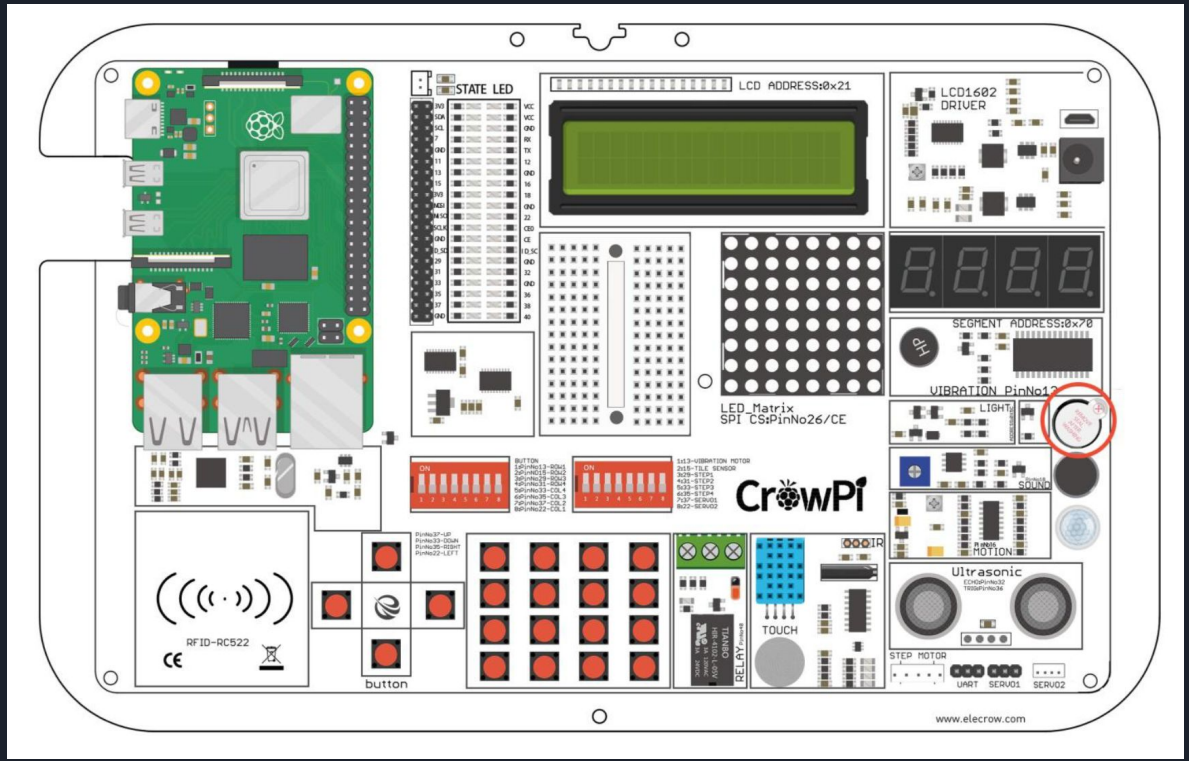
The GPIO.BOARD option specifies that you are referring to the pins by the number of the pin and the plug - i.e the numbers printed on the board (inside the circles on the diagram below)

The GPIO.BCM option means that you are referring to the pins by the "Broadcom SOC channel" number, these are the numbers after "GPIO" in the green rectangles around the outside of the below diagrams:

Activating the Buzz test program

The test python file to activate the buzzer should be located in the “Crowpi” folder on the raspbian OS desktop.

Open the folder and select the “Examples” folder, and open the “Buzzer.py” file (wil automatically open Thonny, a program that you will write and test python code with)



Buzzer.py

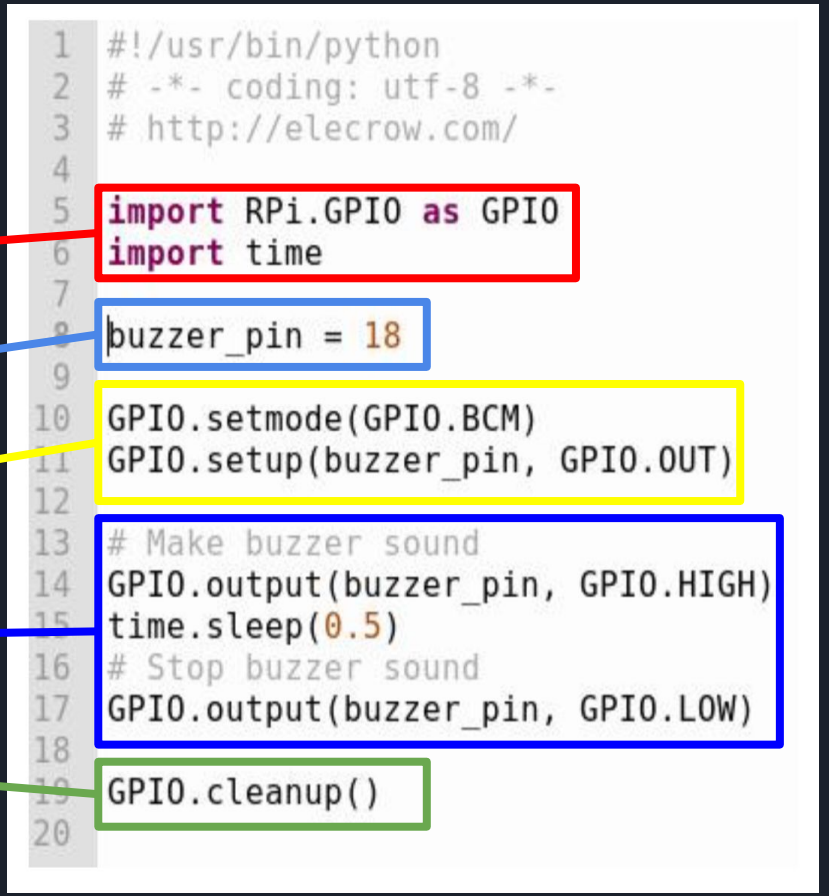
Import RPi.GPIO library and Time Library (RPi.GPIO allows for the use of the GPIO pins and Time sets the duration of the buzzer)

The buzzer is configured at pin 12

GPIO mode set to GPIO BOARD (BCM), Setting up the pin as OUTPUT pin

Output a buzzing signal for 0.5 seconds then turn off

Clears GPIO



More Tutorials available from Crowpi

- Be sure to check out the full tutorial guide that goes over the examples for every module on this kit which also includes python examples as well.
- A PDF will be available to download on Canvas in your IST 440 Section Page.
- If any assistance regarding the hardware is require please contact me at AAA5767@psu.edu