Team:

PRIYANKA SHARMA

HASTI CHITSAZAN

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1. Installation for Raspberry Pi 3

Skip this section if you already have NOOBS installed on the SD Card.

1.1 NOOBS

There are two ways to have NOOBS installed on the SD Card:

a. By buying a preinstalled SD Card.
b. Manually installing NOOBS

The steps for manually installing NOOBS to the SD card are as follows:

I) Download NOOBS from the Raspberry Pi website:
https://www.raspberrypi.org/downloads/

II) Setting up the blank SD card with NOOBS:

a. Format the SD card as FAT.
    i. For Linux: use the command **"gparted"**
b. Download and extract the files from the NOOBS zip file.
c. Copy extracted files to the SD card. Make sure that you do not copy and paste the folder itself. Copy the contents of the folder and paste them onto the formatted SD card.
d. On first boot, the "RECOVERY" FAT partition will be automatically resized to a minimum and a list of OS's that are installed will be displayed.

2. Installation for Zymkey 4i

2.1 Battery Installation

If your battery was preinstalled when the Zymkey was shipped, then skip this step.

I) Use a 3V CR1025.
II) Place the battery in the given slot as directed in the image below.

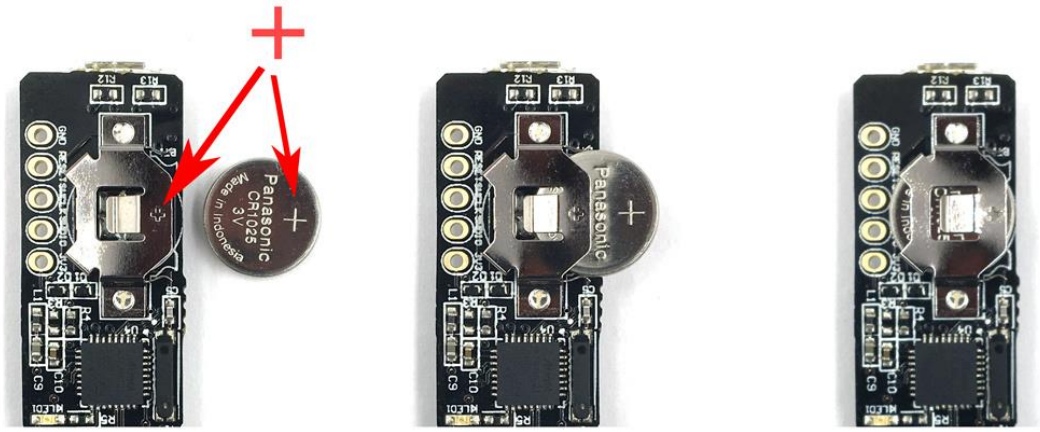


Fig 1. Installing battery for Zymkey 4i.

2.2 Hardware Installation

I) Power down the Raspberry Pi.

II) Carefully align the first 10 GPIO pins correctly with the Zymkey header.
Note: the battery should be facing up.

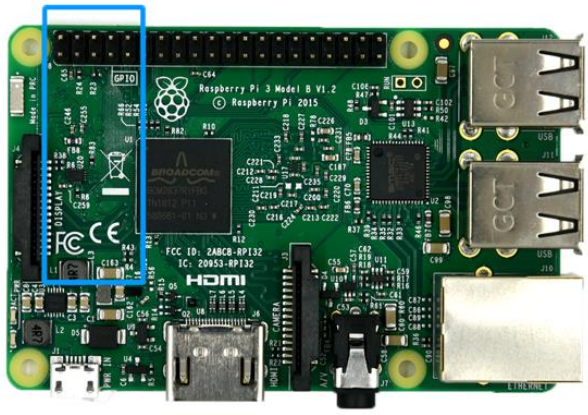


Fig 2. Alignment position for Zymkey 4i and Raspberry Pi

III) **When the Zymkey 4i is properly aligned and placed there should be a blue light. This confirms that the power is on.**

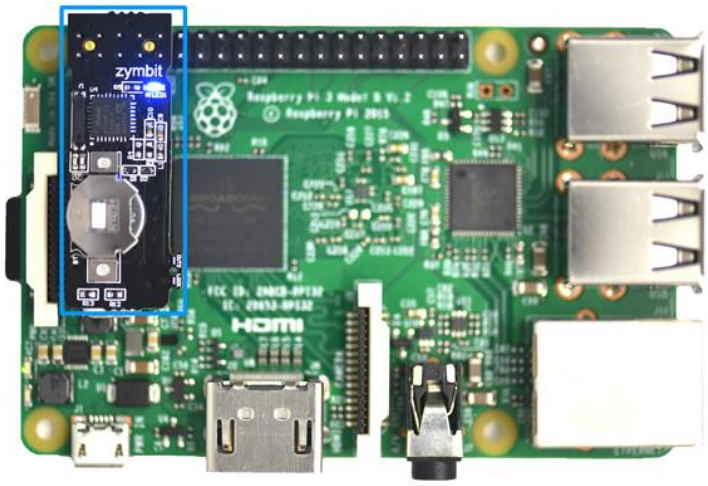


Fig 3. Flashing light of Zymkey 4i (when properly placed)

2.3 Configuring I2C bus

I) **Log into the Raspberry Pi and run: sudo raspi-config**
II) **Select interfacing options**
III) **When it asks "Would you like the ARM I2C interface to be enabled? Select Yes and hit enter.**
IV) **Arrow right to finish.**

2.4 Software Package and API Installation

I) **Log into the Raspberry Pi.**
II) **Download and install necessary zymbit files on the system bu using the command:** `curl -G https://s3.amazonaws.com/zk-sw-repo/install_zk_sw.sh | sudo bash`
III) **When the installation completes, reboot the pi.**
IV) **The pi will then bind itself to the Zymkey.**
V) **After binding the LED should blink once every three seconds.**

3. Data Encryption

I) **Go to Image Encryption folder**
II) **Open Main.py**
III) **Hit F5 or run > run module**

IV) Images in the Images folder will start encrypting and saving a txt file to EncyptedImages

V) You can compare DecryptedImages with original images and will see that they are the same

4. Tamper Detection

I) Go to PerimeterDetection folder

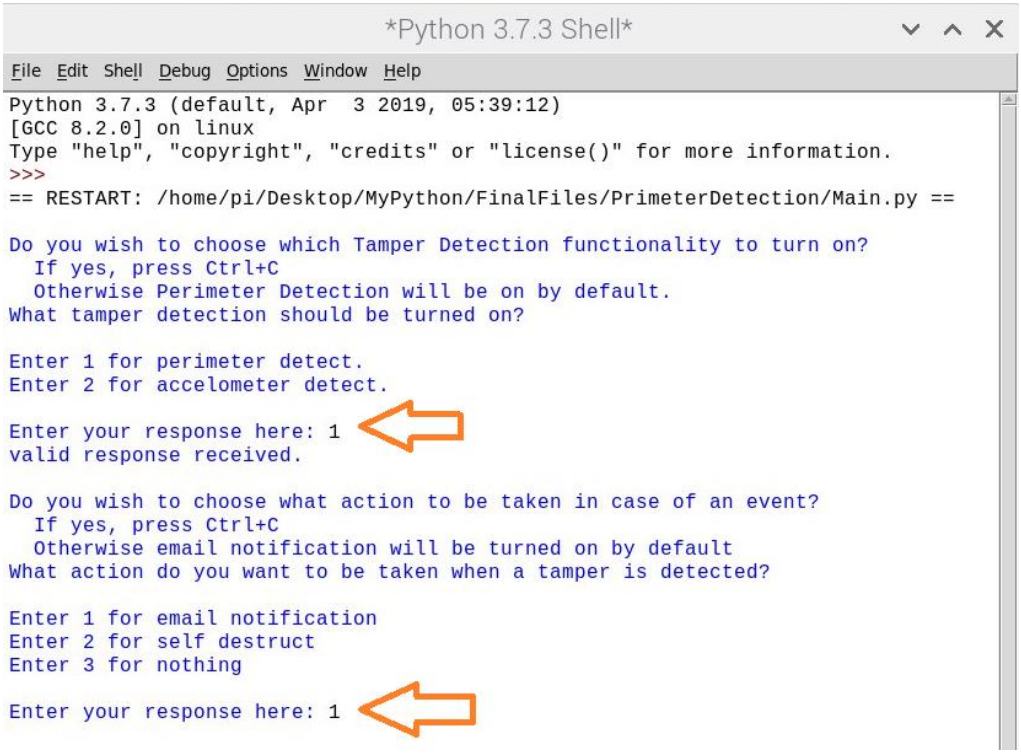
II) Open Main.py

III) Hit F5 or run > run module

IV) Upon running the program, you will get the message to press Ctrl+C to control the actions or let it time out.

V) To run <u>Perimeter Detection,</u> follow the steps below:

a. Hit Ctrl+C
b. Answer 1 to activated perimeter detection
c. To send an email notification hit 1 (selfDestruct code is not enabled because it requires Zymkey 4i to run in production mode). If you hit 3, you will not get an email notification.
d. Result: While both loops are connected "Nothing going on" will display on the screen
e. If one of the loops is broken the message "Breach in inner/outer loop has been detected" will display.
f. Results are also saved into Perimeter_detect_log.txt



Note: If you wait for the time outs, Perimeter Detection and send email notification will be turned on by default

VI) To change the timeout limit, open Misc.py

a. Change time out in line 17 for the first time out
b. Change the time out in line 43 for the second time out.

```
for i in range(0, 10): #10 seconds timeout
```

VII) If you need to change the email address that receives the notifications follow the steps below:

a. Open Actions.py
b. Change rec_email to the target email address

```
rec_email = "zymkey.project@gmail.com"
```

VIII) To run Accelerometer or Tap Detection follow the steps below:

a. Hit Ctrl+C
b. Answer 2 to activated perimeter detection
c. To send an email notification hit 1 (selfDestruct code is not enabled because it requires Zymkey 4i to run in production mode). If you hit 3, you will not get an email notification.
d. Results: The message "No tap is detected" will be displayed until a tap is detected.
e. Results are also saved in Tap_Detect_log.txt

IX) To change the tap sensitivity, follow the steps below:

a. Open TamperDetection.py
b. Go to line 60 and change the number 80.0 to any number between 0 to 100 with 100 for the highest sensitivity

```
#set Zymkey tap sensitivity between 0 to 100, 100 for the most sensative
zymkey.client.set_tap_sensitivity('all', 80.0)
```

5. References

https://community.zymbit.com/t/getting-started-with-zymkey-4i/202