How-To guide:
# Control Door lock using relay and power supply

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The door lock could be controlled through one of the GPIO pins. The reason why we need an external power supply and relay is because 3.3V or 5V from BB is not enough to power door lock.

## Required Hardware:

All hardware components:
- Magnetic door lock
- 5V relay
- 12V power supply
- Beaglebone Green
- Breadboard
- 470 ohm resister
- female to male jumper cable x7
- male to male jumper cable x3
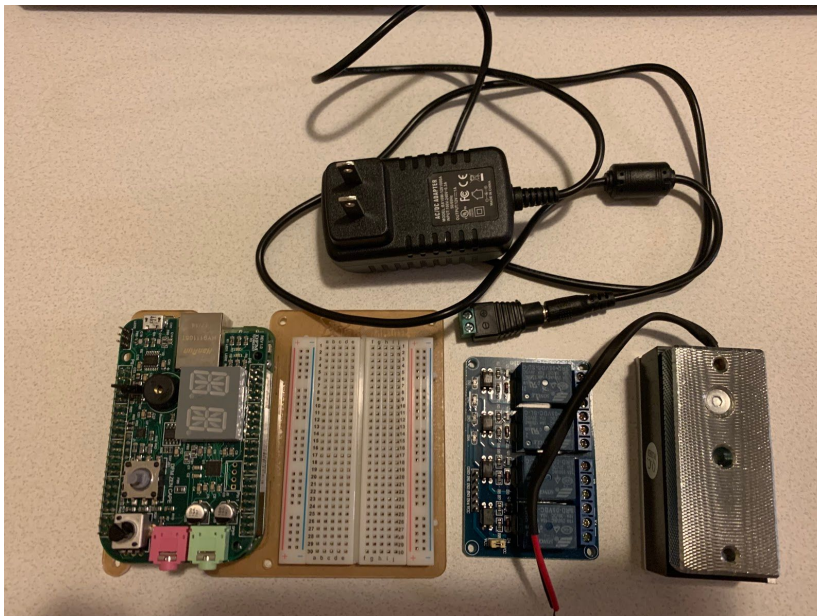
Wiring:

Step 1: Connect Relay to Breadboard

1. Make sure all the wires are unconnected from Beaglebone
2. Connect relay's GND pin to e23 of breadboard
3. Connect relay's IN1 pin to e26 of breadboard
4. Connect relay's VCC pin to e27 of breadboard
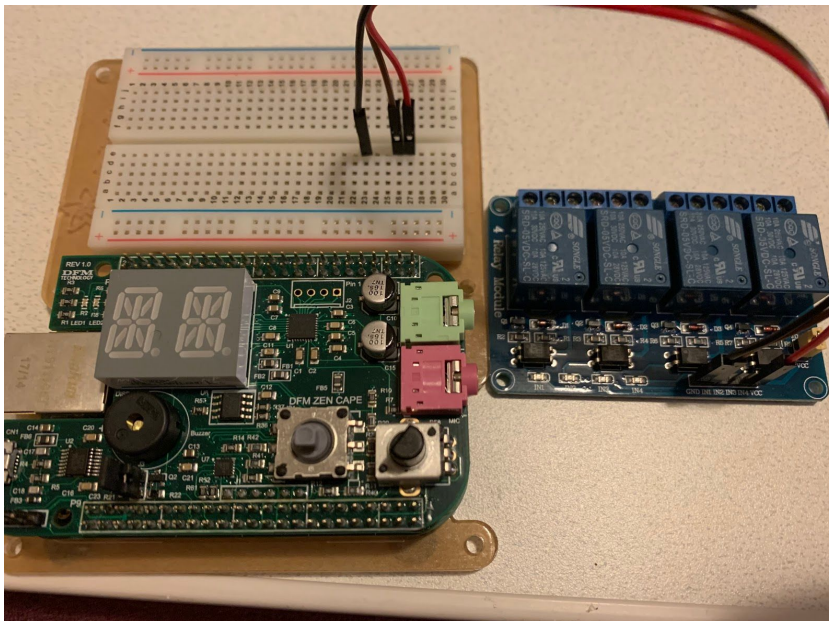

Step 2: Connect BeagleBone to Breadboard

1. Connect BB's pin P9_7(SYS_5V) to a27 of breadboard
2. Connect BB's pin P9_1(DGND) to a23 of breadboard
3. Connect BB's pin P8_46(GPIO_71 for example) to a20 of breadboard
4. Insert 470 ohm resistor to c20 and c26 of breadboard
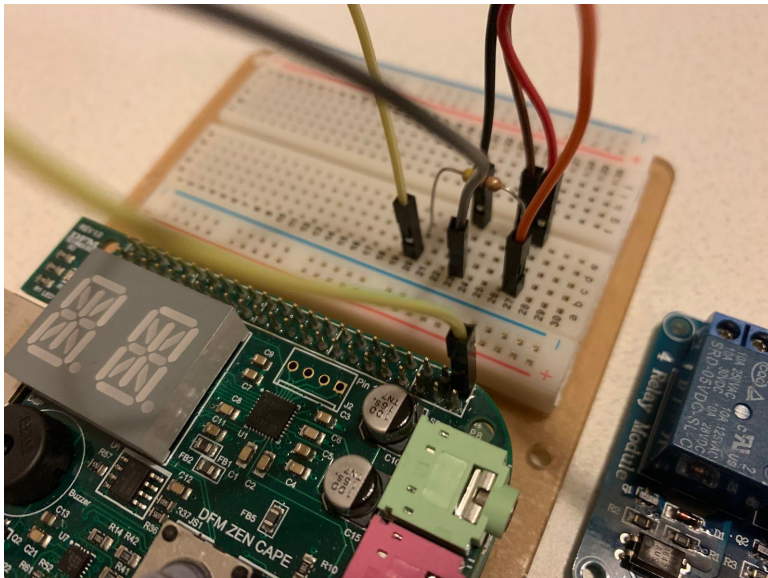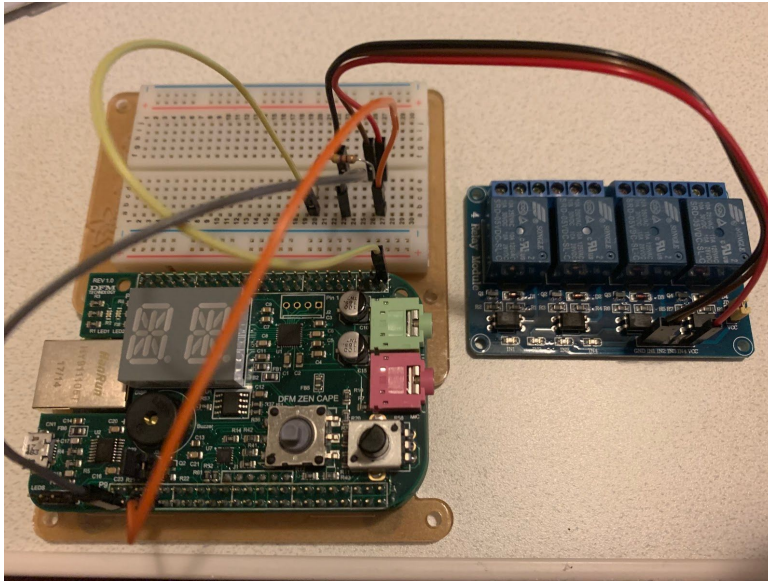
Step 3: Connect Door Lock to relay and breadboard

1. Connect door locks power cable to relay common terminal
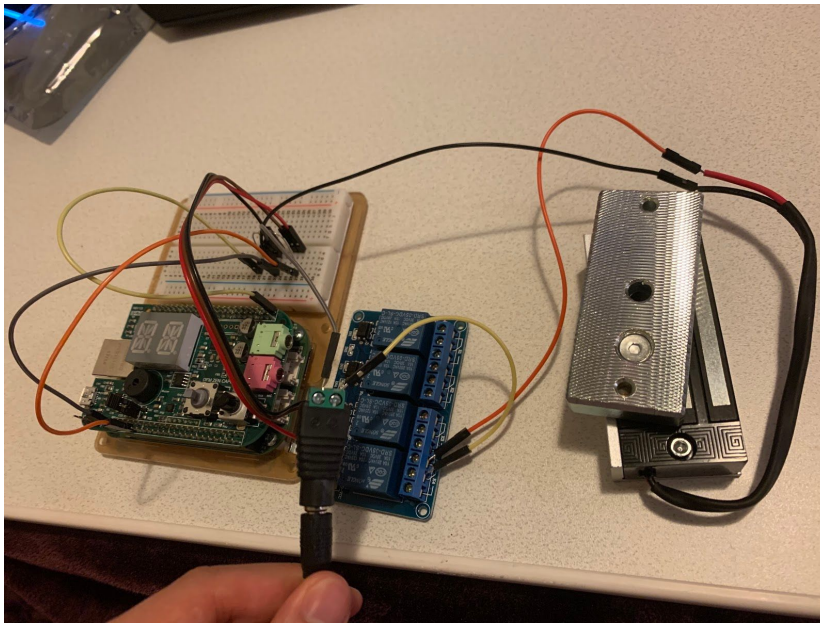2. Connect door locks ground cable to breadboard b23(ground)
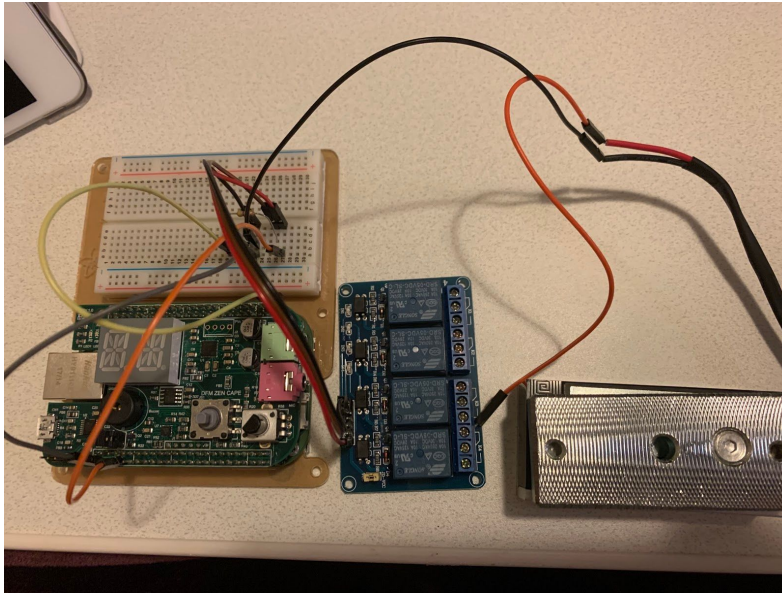
Step 4: Connect Power Supply to relay and breadboard

1. Connect 12V Power Supplies VGG to common terminal of relay
2. Connect 12V Power Supplies ground to ground on breadboard c23
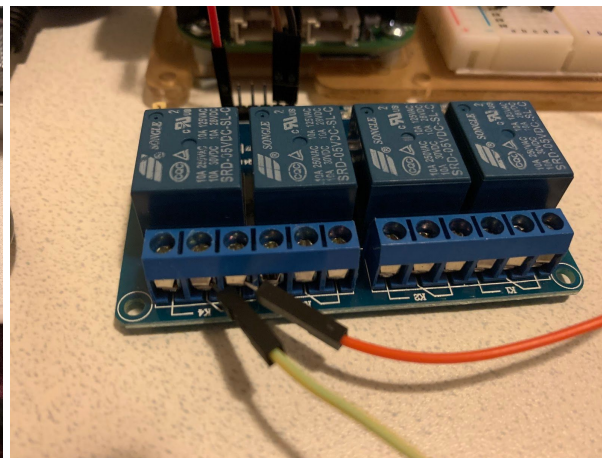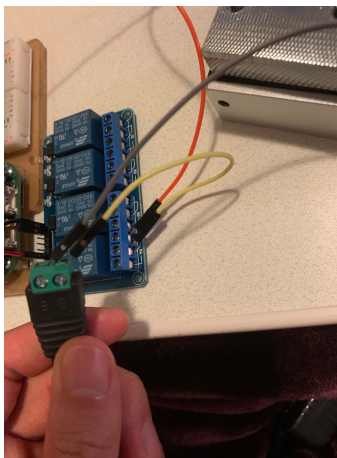
Overall looking of the circuit

Testing

Turn On/Off the door lock by controlling a gpio pin (71 for example)
- Connect Micro USB cable to Beaglebone

- Access to Beaglebone terminal using SSH or Screen

- Tell Linux to handle the pin as GPIO by writing its "Linux GPIO number" to the export file.
  # echo 71 > /sys/class/gpio/export

  If you get the error below
  "write error: Device or resource busy"
  it means your gpio pin is already exported so ignore this step

- Change to the directory of the gpio that you just exported
  # cd /sys/class/gpio/gpio71

- Make the pin an output
  #echo out > direction

- Turn on the door lock
  #echo 1 > value

- Turn off the door lock
  #echo 0 > value

Demo movie:
https://www.youtube.com/watch?v=3On5zq2iORs

Reference:

Brian Fraser, "GPIOGuide",
https://opencoursehub.cs.sfu.ca/bfraser/grav-cms/cmpt433/2019-7/guides/files/GPIOGuide.p
df