

# Save Power on Raspberry Pi

Save power when running on battery by turning off unused peripherals, or features.

[#pi](#) [#power](#)

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## Table of Content

1. Turn off USB
2. Turn off HDMI
3. Throttle CPU
4. Disable Wi-Fi & Bluetooth
5. Disable on-board LEDs

## 1. Turn off USB

Turn **OFF** the USB chip:

```
echo '1-1' | sudo tee /sys/bus/usb/drivers/usb/unbind
```

Turn **ON** the USB chip:

```
echo '1-1' | sudo tee /sys/bus/usb/drivers/usb/bind
```

## 2. Turn off HDMI

Turn **OFF** the HDMI output:

```
sudo /opt/vc/bin/tvservice -o
```

Turn **ON** the HDMI output:

```
sudo /opt/vc/bin/tvservice -p
```

## 3. Throttle CPU

Reduce the clock of the core by changing some parameters in the */boot/config.txt* file:

*/boot/config.txt*

```
arm_freq_min=250  
core_freq_min=100  
sdram_freq_min=150  
over_voltage_min=0
```

## 4. Disable Wi-Fi & Bluetooth

Starting from Raspberry Pi 3, Wifi and Bluetooth are added on hardware, so Raspbian has its method to control these signals in */boot/config.txt* file:

*/boot/config.txt*

```
dtoverlay=pi3-disable-wifi  
dtoverlay=pi3-disable-bt
```



It's correct to use the word **pi3** in the params's value, for other version of RPi.

## Soft-block

The `rfkill` command can be used to soft-block the wireless connections:

```
rfkill list          # displays the state of the modules
rfkill block wifi
rfkill block bluetooth
```

but this does not completely turn off the hardware of the WiFi and the Bluetooth module. They will still draw a little power in the background.

## 5. Disable on-board LEDs

Add below params to the `/boot/config.txt` file:

*/boot/config.txt*

```
dtparam=act_led_trigger=none
dtparam=act_led_activelow=on
```