

# Raspberry Pi 3 B - power optimizations and boot adjustments

## Raspberry Pi overview

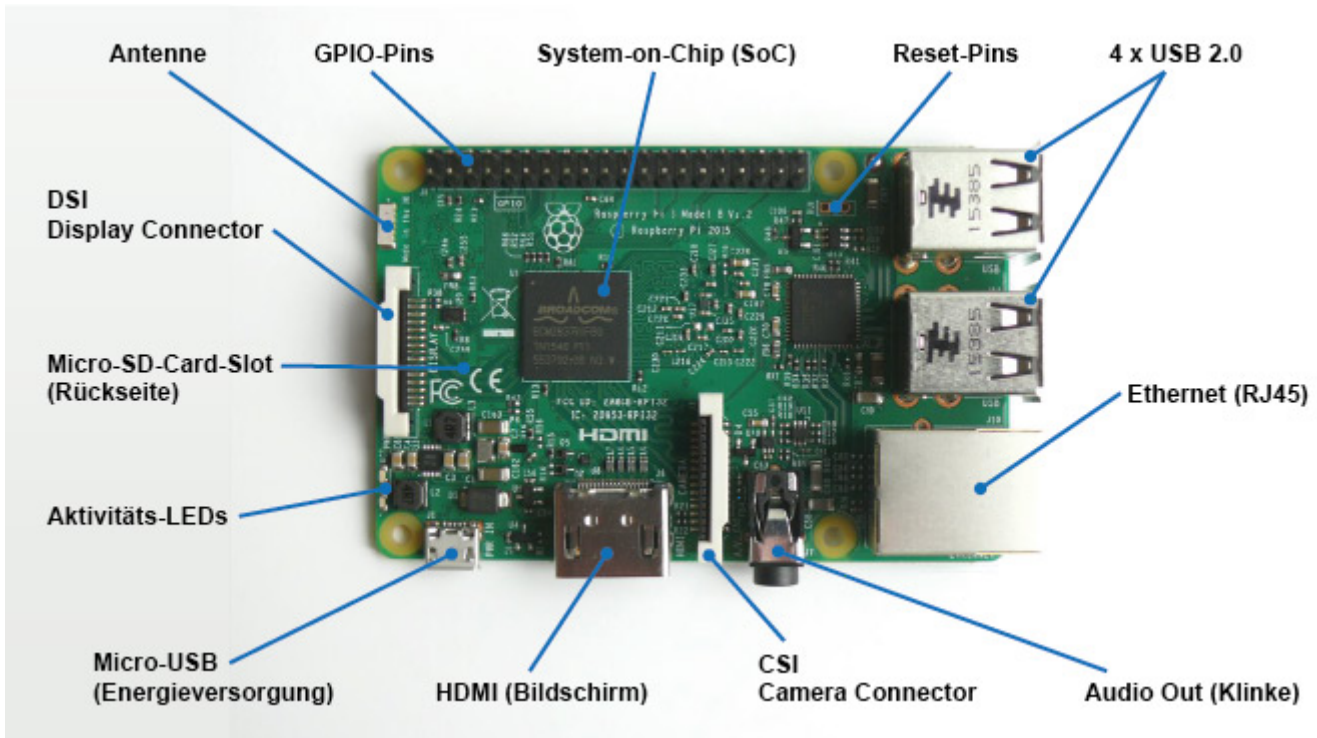


Image source: <https://www.elektronik-kompodium.de/sites/raspberry-pi/1905251.htm>

## HDMI deactivation

HDMI is disabled by default if no monitor is connected. If a monitor is connected this can be either enabled or disabled manually by the following commands

```
/opt/vc/bin/tvservice -o  
#or sh vcgencmd display_power 1  
  
#re-enable with  
sudo /opt/vc/bin/tvservice -p
```

# Bluetooth and WiFi deactivation (this is not going to be applied to Trikarus!)

```
vim /boot/config.txt
```

```
#dtoverlay=disable-wifi #enabled again! (backup remote connection)
#dtoverlay=disable-bt #enabled again! (filament weigh sub project requires to have it enabled)
```

## Status LED deactivation (saves ~30 mA)

### Red PWR LED

- on if power OK
- flashes (or goes out) if the power drops below about 4.63V

### Green ACT LED

- steady on if no SD card during boot
- irregular flashes for SD card access

### Ethernet Socket Left LED (yellow)

- on 100-Mbps connection
- off 10-Mbps connection

### Ethernet Socket Right LED (green)

- on if link established
- flashes for port activity
- off if no link is established

## Version 1 (is not used)

```
vim /boot/config.txt
```

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

## Version 2 (is used)

```
vim /opt/disable_leds.sh
```

```
#!/bin/bash
echo none > /sys/class/leds/led0/trigger
echo none > /sys/class/leds/led1/trigger
echo 0 > /sys/class/leds/led0/brightness
echo 0 > /sys/class/leds/led1/brightness
```

```
chmod +x /opt/disable_leds.sh
```

```
vim /etc/cron.d/disable_leds
```

```
# this script disables Raspberry Pi LEDs after bootup
SHELL=/bin/sh
PATH=/usr/local/sbin:/usr/local/bin:/sbin:/bin:/usr/sbin:/usr/bin
*/1 * * * * root /opt/disable_leds.sh
```

## CPU throttling (this is not going to be applied to Trikarus!)

- <https://learn.pi-supply.com/make/how-to-save-power-on-your-raspberry-pi/#throttle-cpu>
- <https://www.raspberrypi.org/documentation/configuration/config-txt/overclocking.md>

```
vim /boot/config.txt
```

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

## USB deactivation

See [Smart Stepper - USB, Soft and hard reset](#) for USB scripts

## Audio deactivation

```
vim /boot/config.txt
```

```
dtparam=audio=off
```

## USB power and Raspberry Pi undervoltage

It seems possible to reduce the total allowed load from 1200 mA to 600 mA →

<https://www.raspberrypi.org/documentation/configuration/config-txt/misc.md>

It was tested but seems to make no difference. So it was not applied to Trikarus configuration

```
max_usb_current=1 #1200 mA
```

```
max_usb_current=0 #600 mA
```

## Problem description

- dmesg shows detected undervoltage at startup
- Monitoring shows the same undervoltage peak

Webcam might not be available due to error while addressing USB devices

```
[ 55.651885] usb 1-1.5: device not accepting address 11, error -110
[ 55.751888] usb 1-1.5: new high-speed USB device number 13 using dwc_otg
[ 66.291906] usb 1-1.5: device not accepting address 13, error -110
[ 66.292050] usb 1-1-port5: unable to enumerate USB device
```

## Solution

- not known yet. USV is built to deliver more than 10 Watt at USB but Raspberry Pi never draws more than 4.35 W (see [General power/wiring concept, consumptions and temperatures](#) for measurements values)

# GPU memory and troubleshooting "failed to open VCHI service (-1)"

This is okay/harmless message. The GPU memory was set to 16 MB in /boot/config.txt so some services are not available with such low memory.

## /boot/config.txt Overview

Some default values were changed to the following:

```
dtparam=i2c_arm=on
dtparam=audio=off
gpu_mem=16 #GUI not used so use the memory for better things
boot_delay=3 #did not really help to omit the once per bootup occurring undervoltage but may help to wait for connected USB Stick
```

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Version #2

Erstellt: 2026-06-08 14:43:15 CEST von Mario Voigt

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