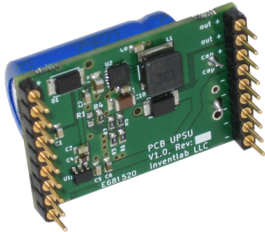
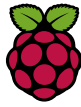


Application Raspberry Pi UPS: Switch on and off by power source

PCB UPS[®]



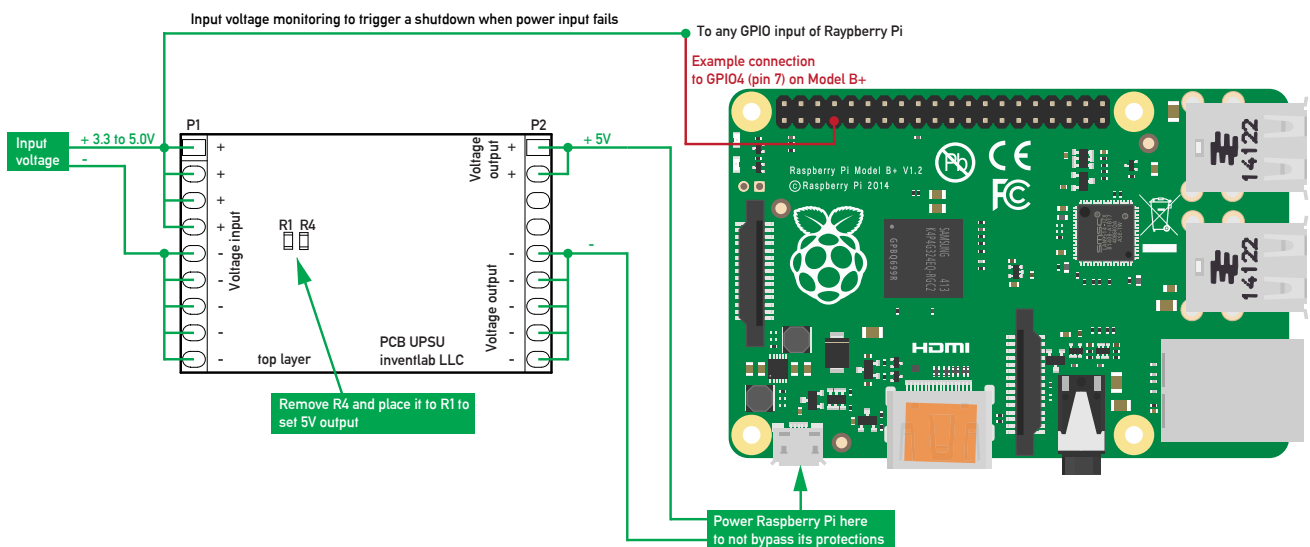
PCB UPSU

Raspberry Pi

Raspberry Pi is well for applications like IoT devices. It's powered from a 5VDC source and the operating system starts up, as soon as this voltage is available. A shutdown can be done by the operating system. But much IoT applications are on the field and there's no human interface available. Sometimes there is even no access to the devices. And: A power failure can occur everytime. So a solution is required to shutdown the OS on the Raspberry Pi, when the input voltage fails.

The solution described here is connecting PCB UPSU to Raspberry Pi to shutdown the operating system when input voltage fails. This allows to turn on and off the Raspberry Pi by switching on and off the power source. Because PCB UPSU's energy storage is based on ultracapacitor, this solution is maintenance-free, has high cycle life, extended operating temperature range and requires no battery replacement.

Connecting PCB UPSU and Raspberry Pi together



Note: Powering the Raspberry Pi by the GPIO header is also possible, but this way you bypass power input protections.

Configuring the operating system to shutdown when input voltage fails

The following Python script file can be placed for example here: /home/pi/pcbupsu/pcbupsushutdown.py

```
#!/usr/bin/python
import RPi.GPIO as gpio
import os
gpio.setmode(gpio.BOARD)
gpio.setup(7, gpio.IN, pull_up_down=GPIO.PUD_DOWN) # Set pin 7 as an input with internal pull down
gpio.wait_for_edge(7, gpio.FALLING) # Set interrupt, triggered when voltage in fails
os.system('shutdown now -h') # Shutdown the os
```

The shell script to start the Python script with root access:

```
#!/bin/sh
cd /
cd home/pi/pcbupsu
sudo python pcbupsushutdown.py
cd /
```

Create a logging directory by command: `mkdir /home/pi/pcbupsu/logs`

Edit the crontab by command: `sudo crontab -e`

Append the following to the crontab file:

```
@reboot sh /home/pi/pcbupsu/pcbupsushutdown.sh >/home/pi/pcbupsu/logs/cronlog 2>&1
```

Reboot your Raspberry Pi

If PCB UPSU's capacity is not enough: Increase shutdown time / PCB UPSU capacity

You can increase the shutdown time by adding additional ultracapacitors to PCB UPSU. See datasheet

of PCB UPSU to see how to do this. See www.pcb-upsu.com

Note: If the capacity is near its limit to shutdown your operating system, it's recommended to add addi-

tional Ultracapacitors too, due to capacity decrease over the lifetime.



More informations and where to buy PCB UPSU?

Visit:

- ▶ www.pcb-upsu.com
- ▶ <http://shop.inventlab.ch>



Your application requires higher output power than PCB UPSU can provide?

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