NEWSLETTER 1/2015
„RASPBERRY PI BAT PROJEKT"
News and Add-ons
WLAN connection and UMTS (SMS transmission)

"Raspberry Pi is a trademark of the Raspberry Pi Foundation, http://www.raspberrypi.org"
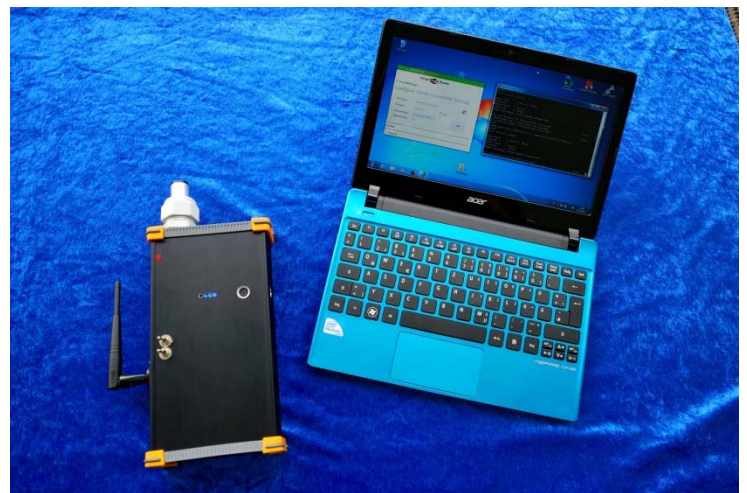
1.   New„WLAN-Raspi-bat detector"

Wireless-LAN USB-Adapter (300Mbit/s) with antenna Edimax EW-7612U -
http://www.amazon.de/dp/B007H5WXB0/ref=pe_386171_51767411_TE_M3T1_dp_1

A new tool has been developed for direct wireless access to the RaspberryPi bat detector via an external notebook. This allows the wireless manipulation of the configuration and the recording data. Depending on WLAN reception and operating conditions, distances up to 100 meters can be spanned communicating between notebook and WLAN RaspberryPi bat detector. All actions, can take place simultaneously to the recording .

There are numerous applications for the tool, e.g. operation at locations hard to access, like steppels, buildings with difficult access etc. and trees up to the canopy (i.e. solar-powered for continuous monitoring). Using the new add-on, data can easily be copied or downloaded from the RaspberryPi bat detector to the notebook outside the building or under the tree. Even SD storage can be cleared completely.
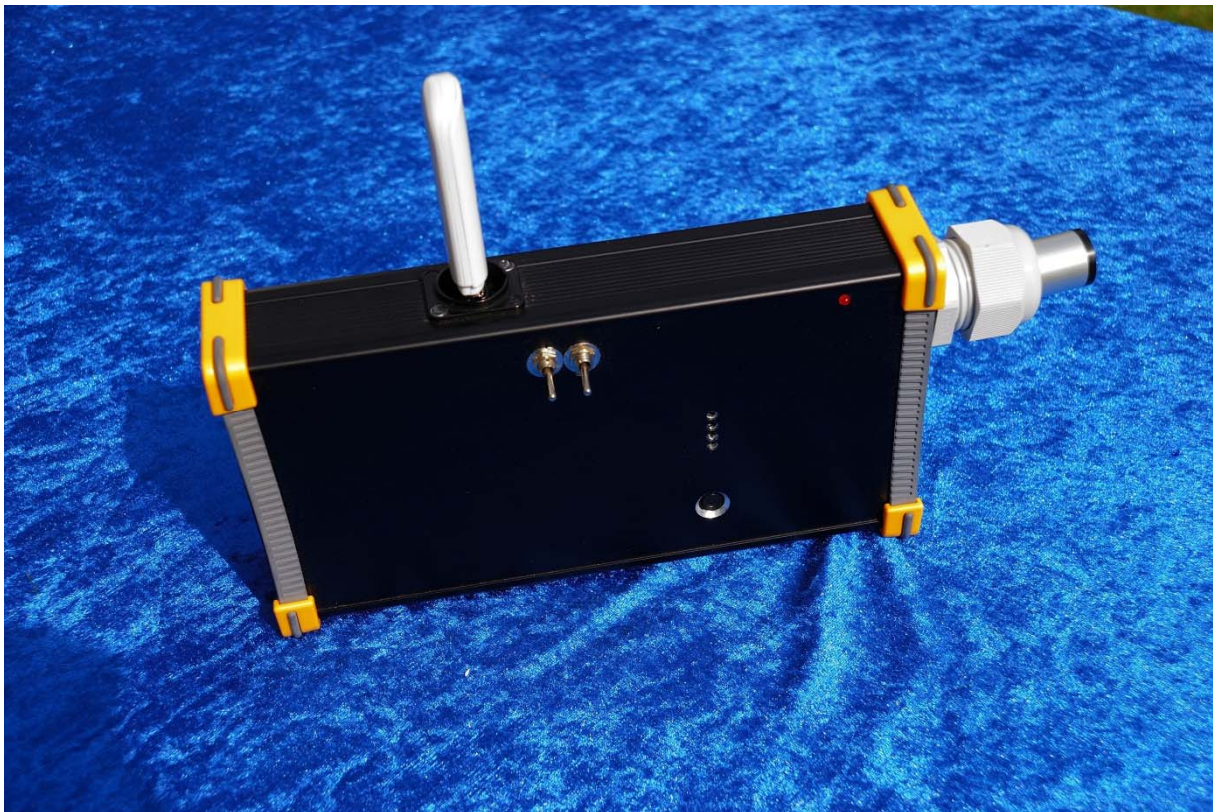

Connection to a notebook Model B+, accumulator (Dadidong), WLAN antenna (Edimax), Dodotronic Ultramic250K in box made by Fischer www.fischerelektronik.de

2. New „SMS-Raspi bat detector"

Via a UMTS stick (Huawei Model E173u-1) and some modifications of the established image of the Raspberry Pi bat project, it has recently become possible to send SMS text messages automatically at freely configurable times. These could be for example after booting the device or just before shutting it down. Messages may contain short texts, information about remaining storage capacity of the memory card or the number of recorded files. SMS can be delivered to one or more recipients. This serves to check whether the system is still running and if enough battery capacity is remaining. The SMS may give the bat worker hints on activity peaks of the last night.

Due to the limited length of a SMS message, the transfers of large like wav.files doesnot fit to the purpose of this tool and therefore wasnot part of the add-on design. Innovative ideas in this field are welcome.

Example of a hand detector with UMTS stick enabled to send SMS.

It is up to you to choose the right tool for your application conditions.

Example for combinations of the tools:

Model B+ with accumulator (Dadidong), WLAN antenna (Edimax),UMTS stick (white, Huawei Model E173u-1) and Dodotronic Ultramic250K
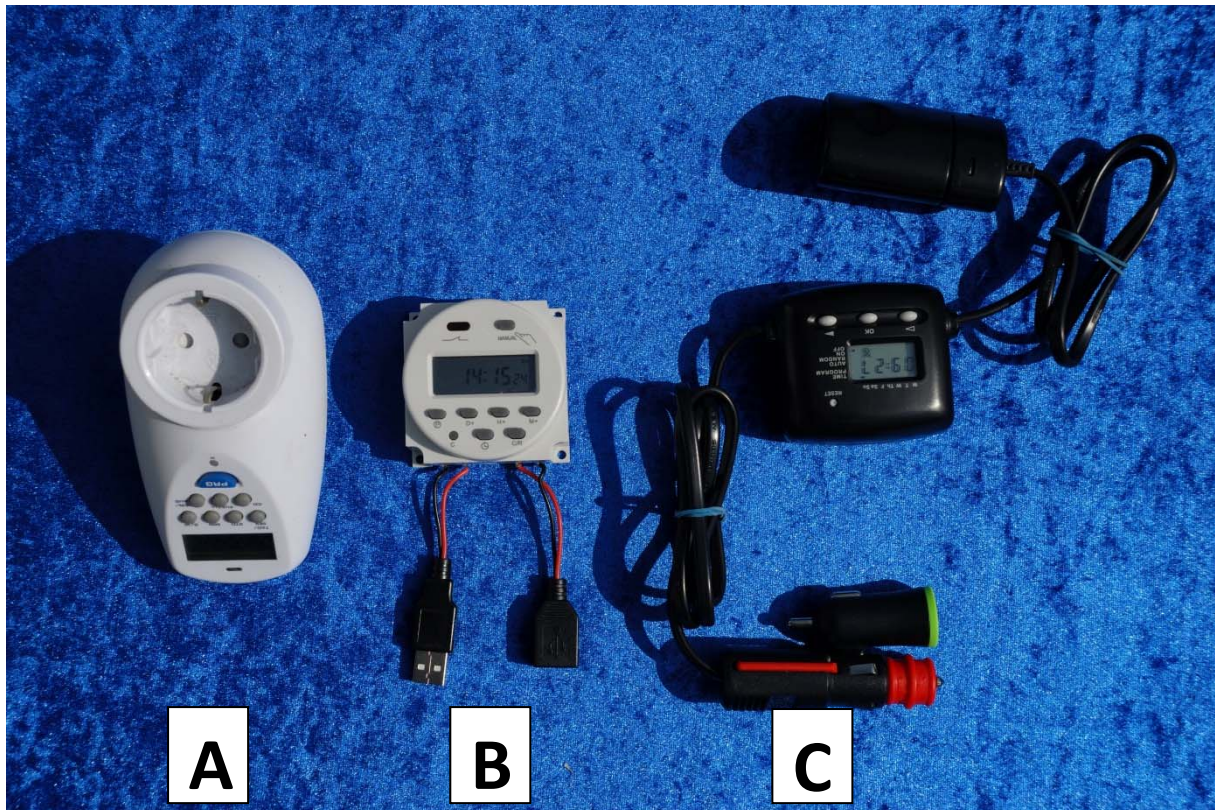

Model A+ with accumulator (Dadidong), WLAN antenna (Edimax), USB hub (only one USBport on board of the A+) ,UMTS stick (Huawei model E173u-1) and Dodotronic Ultramic250K

3. Long-term bat detection system using <u>clock timer</u>

Trying to save power and data space on the SD card we searched for a tool to limit recording time to an adequate day (night) time. Alarm Pi originally favored is no longer available. Disadvantage of this system was the fact that RaspberryPi, when shut down by AlarmPi module, still consumes low level energy.

A simple variant is a conventional clock timer. It enables to start and shut down the Raspberry Pi at user-selectable start and stop time. Energy consumption is still a question. Three variants of clock timer are discussed.

A.) If 220V are available a commercial clock timer is a good advice.

B.) In field a 5 Volt weekly clock timer with USB outlet using a button-type battery (3 years lifetime specified by manufacturer, not tested) can be used.

C.) If a 12 Volt weekly clock timer, requiring a 12 Volt lead-acid battery is used. It is necessary to install a 12/5V voltage converter (e.g. Belkin) to supply the voltage necessary to run the RaspberryPi.

Example of water-resistant equipment:

Model A+ with 20 Ah lead-acid battery, cottenpickers clock timer, Belkin voltage converter12/5 Volt and Dodotronic Ultramic250K in a water-resistant XCASE

Model B+ with 20 Ah lead-acid battery, 12 Volt weekly timer, Belkin voltage converter 12/5 Volt and Dodotronic Ultramic250K in water-resistant XCASE

Model B+ with 20 Ah lead-acid battery, cottenpickers clock timer, Belkin voltage converter 12/5 Volt and Dodotronic Ultramic250Kin water-resistant XCASE

Clock timer : suppliers
B: http://ccgi.cottonpickers.plus.com/forum/viewtopic.php?f=4&t=493

ATTENTION !!! the cottonpickers clock timer may need RESET before use
press the „c" key, to erase default settings of the switching times!

C: http://www.amazon.de/GEV-12-V-Kfz-Zeitschaltuhr/dp/B0000WPAVW/ref=sr_1_3?s=diy&ie=UTF8&qid=1432196650&sr=1-3&keywords=zeitschaltuhr+12+volt

4. Long-term monitoring <u>using a solar module:</u>

The two highly economical modules A+ and B+ (slightly more energy consumption) are ideal for solar-powered operation.

Suitable solar equipment is available from about 100 Euro (solar panel, solar charge controller, accumulator and cables).

Assuming a power consumption of ca. 200 mA (10 h operation per night using 5 Volt = 10 Watt), a 20 Watt solar panel should be well sufficient.

Examples of components see below:

Belkin voltage transformer 12/5 Volt

Ultramic250K   Raspberry Pi Model A+

Cottenpickers Clock Timer

2possible charge controllers   20 Ah lead-acid accumulator   20 Watt solar panel

- charger 5 V with integrated USB port for direct connection

- charger 12 V without USB port/ a 12/5 V converter (i.e. Belkin) is needed

Description of the RaspberryPi + models –
B plus (B+) and model A plus (A+)

http://www.raspberrypi.org/products/model-b-plus/
http://de.wikipedia.org/wiki/Raspberry_Pi

Model comparison at:
http://www.element14.com/community/community/raspberry-pi/raspberry-pi-bplus

Image
data image currently used :

hk-bat-plus-24-11-2014.img

The image has been rebuilt for the + models. Take care that it is only valid for the new model B plus (B+) and model A plus (A+)

Download is provided on the known internet page:

http://www.fledermausschutz.de/forschen/fledermausrufe-aufnehmen/raspberry-pi-bat-project/

The established model B handbook remains valid concerning the general configuration. All settings options are the same as for model B. Just the USB-Reset, necessary for the previous model B, is no longer required. In the file recordings.sh, it was therefore commented out by prepending „##" at the beginning of the respective source line.
The new B plus model is significantly more power-saving and stable..

Interesting and proofed parameter settings for recordings of both models are listed at the internet page in a „Tips and Tricks" (FAQ) section:http://www.fledermausschutz.de/forschen/fledermausrufe-aufnehmen/raspberry-pi-bat-project/haeufig-gestellte-fragen-faq/
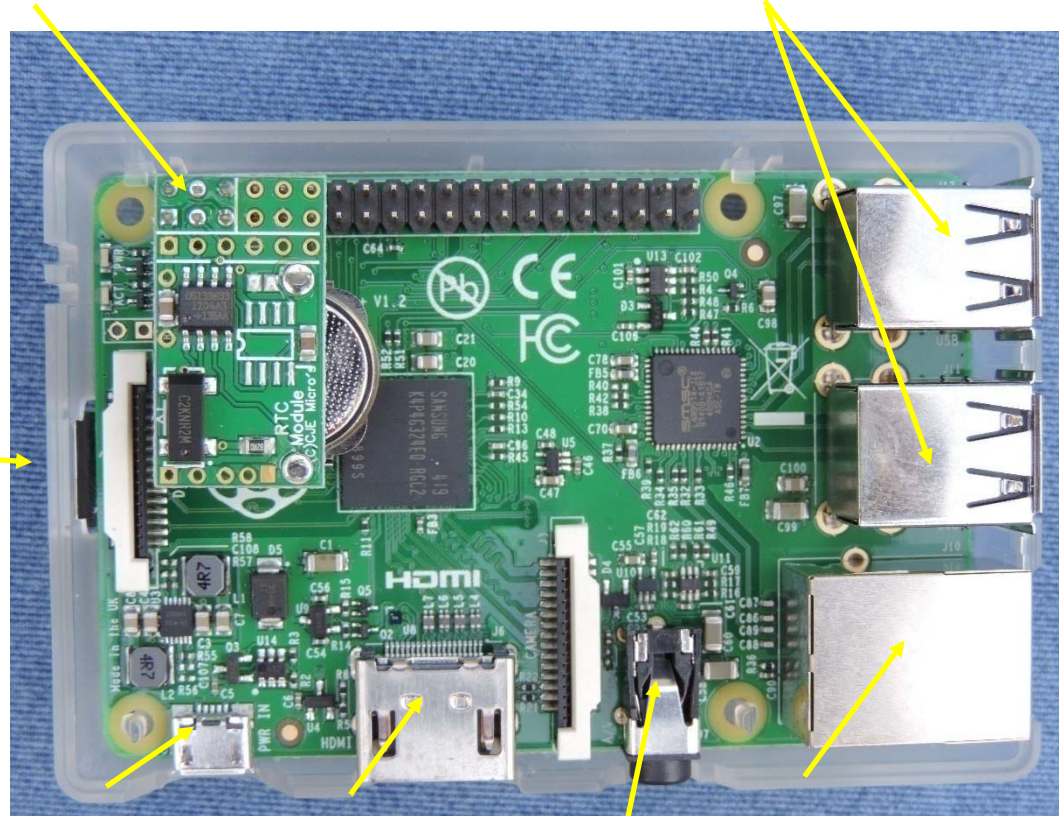We remind you that all settings are at least depending on your approach and your special recording situation.

Short description of the new model B plus (B+):
https://www.raspberrypi.org/products/model-b-plus/

Attached RTC module*   4 x USB ports

microSDHC
card

power connector   HDMI video connector   ethernet connector

composite-video/audio (combined) connector

*****RTC module** (see picture above)
(http://www.cjemicros.co.uk/micros/individual/newprodpages/prodinfo.php?prodcode=4D-RaspberryPi-RealTimeClock-RTC)

Suitable microSDHC cards are listed at:
http://elinux.org/RPi_SD_cards#Working_.2F_Non-working_SD_cards

Following SanDisk card was successfully tested: SanDisk Ultra 32GB Class 10,
e.g..:http://www.amazon.de/dp/B007XZM6VG/ref=pe_386171_37038021_TE_3p_
M3T1_dp_1

Short description of the new model A plus (A+)
https://www.raspberrypi.org/products/model-a-plus/

Attached RTC module*   1 x USB port

microSDHC
card

power connector   HDMI video-connector   composite video/audio
                                                   (combined) connector

*RTC module (see picture above)
(http://www.cjemicros.co.uk/micros/individual/newprodpages/prodinfo.php?prodcode=4D-RaspberryPi-RealTimeClock-RTC)
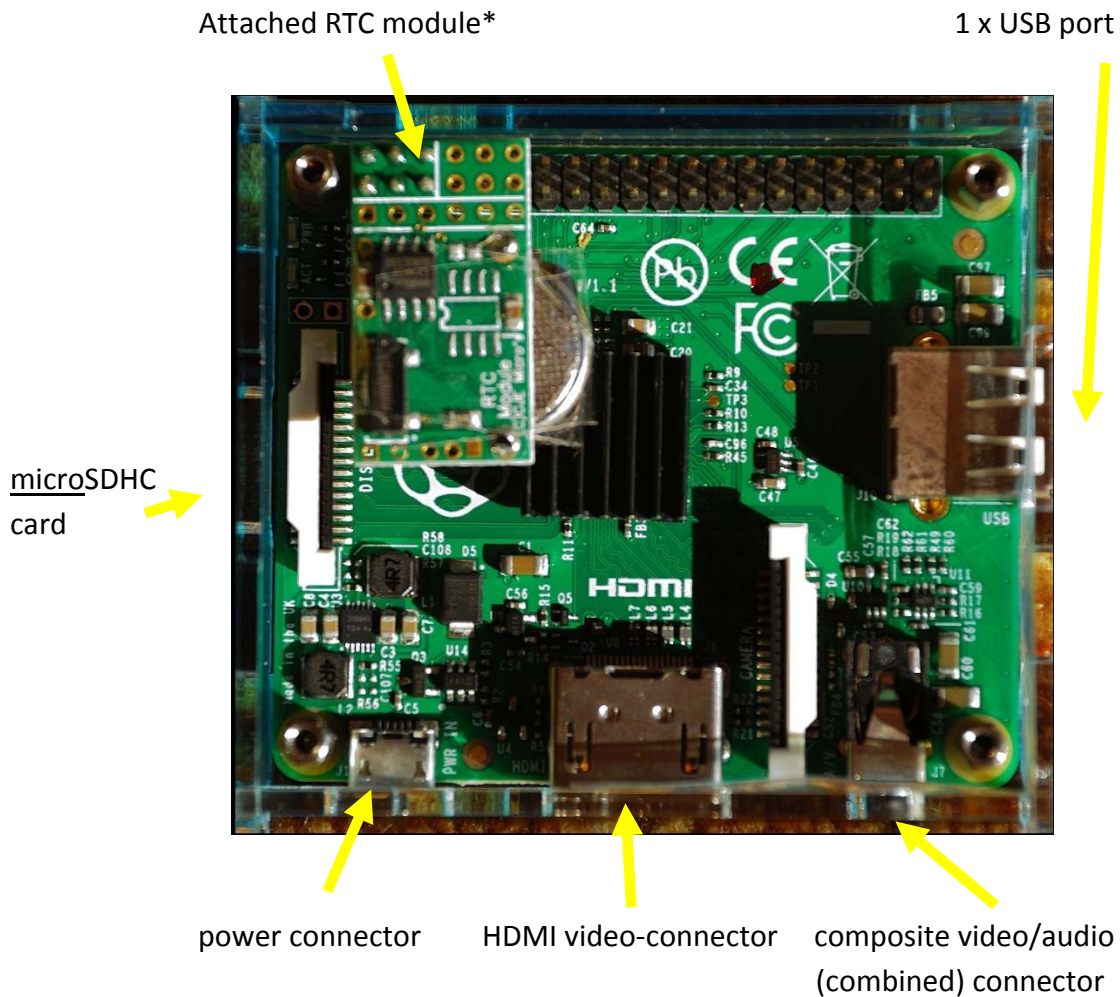
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5. Software description New „WLAN-Raspi bat detector"

WLAN

Software necessary for windows:
Putty   : http://www.heise.de/download/putty.html
Winscp   : http://www.heise.de/download/winscp.html
virtual router 1 : http://www.chip.de/downloads/Virtual-WiFi-Router_52197561.html

You will find detailed description here:
http://www.fledermausschutz.de/forschen/fledermausrufe-aufnehmen/raspberry-pi-bat-project/haeufig-gestellte-fragen-faq/

Configuration settings for WLAN image „Raspberry Bat Project"

1:   Turn off Power Saving ("sleep mode")

filename   :   /etc/modprobe.d/8192cu.conf
setting   :   options 8192cu rtw_power_mgnt=0 rtw_enusbss=0

2:   If IP address is configured manually

filename   :   */etc/network/interfaces/*
setting   :

```
auto lo
iface lo inet loopback

iface eth0 inet static

auto wlan0
allow-hotplug wlan0
iface wlan0 inet static
address 192.168.173.149
netmask 255.255.255.0
gateway 192.168.173.1
wpa-ap-scan 1
wpa-scan-ssid 1
wpa-ssid "WIN-KBE0EQV8G0I-84240"
wpa-psk "raspibat"
```

After configuration editing, following shell command must be done:
Sudo service networking restart

address 192.168.173.149
wpa-ssid "WIN-KBE0EQV8G0I-84240"
wpa-psk "raspibat"

wpa-ssid and wpa-psk are freely configurable !
IP address is user-selectable, starting from: 192.168.173.145 !

3: Problem: WLAN connection is lost
Solution: reconnect

Solution:

A.   Change to the directory /etc/ifplugd/action.d/ –
cd /etc/ifplugd/action.d
Within this folder, rename the file ifupdown to ifupdown.original –
mv ifupdown ifupdown.original
This command generates a backup copy.
Using this file, the original state can be restored at any time.

B.   Afterwards copy the file /etc/wpa_supplicant/ifupdown.sh as ifupdown into the current directory –
cp /etc/wpa_supplicant/ifupdown.sh ./ifupdown
After connection loss, the WLAN connection should be restored automatically.

C.   Restart the Raspberry Pi:
Sudo reboot
in order to make the configuration change effective.

Important advice:

1.)   The Raspberry Pi configuration must be reset to its original state if wired ethernet is used. Wired mode is not operating using this configuration for a stable WLAN connection.
From within the directory **/etc/ifplugd/action.d/** : delete the WLAN version using
rm ifupdown
and activate the backup copy using
cp ifupdown.original ifupdown

2.)   Internet time service (ntp) should be disabled:
turn off ntp-Server and remove it from startup scripts:
update-rc.d -f ntp remove
Enable time service again using: update-rc.d -f ntp defaults

Description of <mark>New</mark> „SMS-Raspi bat detector"
Software update will be available at a later date, when programming of the new image is finished.

The outcome of the new image will probably not before July. The new will contain the necessary WLAN and SMS extensions.

Your feedback and new ideas are welcome.
Holger Körber
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RaspberryPi bat project:
http://www.fledermausschutz.de/forschen/fledermausrufe-aufnehmen/raspberry-pi-bat-project/