Configuring Your Raspberry Pi

With Linux 3.18 (or higher) a new way to load device drivers have been introduced to the Raspberry Pi environment. It is called device tree overlay. This brings big changes to the way how to configure the necessary drivers for the PiFi boards.

Remove drivers from the blacklist

Remove the following lines from /etc/modprobe.d/raspi-blacklist.conf on Raspbian. If you're using another distribution, check where it configures module blacklists.

`blacklist i2c-bcm2708`

`blacklist snd-soc-pcm512x`

`blacklist snd-soc-wm8804`

Remove the driver for the onboard sound

Remove the line

`snd_bcm2835`

from /etc/modules

Configure device tree overlay file

You don't have to edit /etc/modules anymore, but need to load the correct device tree file. To do this, you must edit /boot/config.txt and add the following line

DAC

`dtoverlay=hifiberry-dac`

DAC+

`dtoverlay=hifiberry-dacplus`

Digi/Digi+

`dtoverlay=hifiberry-digi`

Configure ALSA

Create /etc/asound.conf with the following content:

```
pcm.!default {

type hw card 0

}

ctl.!default {

type hw card 0

}
```

Reboot again now

Test it

Check, if the sound card is enabled with "aplay":

```
pi@raspberrypi ~ $ aplay -l

**** List of PLAYBACK Hardware Devices ****

card 0: sndrpihifiberry [snd_rpi_hifiberry_dac],

device 0: HifiBerry DAC HiFi pcm5102a-hifi-0 []

Subdevices: 1/1

Subdevice #0: subdevice #0
```

You can use aplay, to playback a WAV file. Note that aplayer won't convert files that are in a format that is not natively supported from our drivers. (e.g. mono files or different sample rates). For other file formats (MP3, FLAC, …) We recommend to use mplayer.

```
sudo apt-get install mplayer
```

Some users have reported problems with MP3 playback of mplayer. It seems, that the MP3 codec is not installed by default on all systems. We found the FLAC format to be best supported by mplayer.

Depending of the board you're using it will show another PiFi sound card (DAC, DAC+, Digi, Digi+)

Device not recognised?

This could be caused by typos in config.txt or blacklisted drivers. Add "dtdebug=1" to your config.txt. Have a look at the output of "dmesg" and the output of "sudo vcdbg log msg".

Updating the Linux kernel

Our PiFi Digi and DAC boards are supported in the current Raspberry Pi linux kernel. However, most distributions do not use the latest kernel, but older versions. Therefore you might need to update your kernel. With many distributions this is relatively easy. We provide a guide here.

Note: **Always make a backup before updating the kernel!** There are lots of things that can go wrong. Power losses during the upgrade will make you system unusable, but also incompatibilities might happen.

Raspbian

This is the easiest as this is the "official" Raspberry distribution. Install the rpi-update package first and then update the kernel:

```
sudo apt-get install rpi-update
```

```
sudo rpi-update
```

OpenElec

OpenElec uses a very special file system layout and kernel. You can't simply update the kernel here. Wait for the OpenElec release with integrated PiFi support.

Other distributions (e.g. Raspbmc)

On many other distributions, rpi-update will also work. However, we can't guarantee it. You should try this by yourself. If you have any valuable data on your system, back it up before doing this! Update the repositories

```
sudo apt-get update
```

Install rpi-update using apt-get

The easiest way is installing thr necessary rpi-update package using apt-get:

```
sudo apt-get install -y rpi-update
```

However on some distributions, this won't work as the necessary repository is not configured. In this case you will get an error message like this:

```
E: Unable to locate package rpi-update
```

In this case you have to use a more complex procedure to install rpi-update – using git.

Install rpi-update via GIT

First install git, curl and binutils

```
sudo apt-get install -y git-core curl binutils
```

If you're not using a Debian-based distribution, apt-get might not work. Check the documentation of your distribution how to install git. It might be installed already.

On many Debian distributions you have to update the SSL certificates first

```
sudo apt-get install -y ca-certificates
```

Then install rpi-update via git

```
sudo wget
```

```
https://raw.github.com/Hexxeh/rpi-update/master/r
```

```
pi-updat
```

```
e -O /usr/bin/rpi-update && sudo chmod +x /usr/bin/rpi-update
```

Update the kernel

Now you can run rpi-update

```
sudo /usr/bin/rpi-update
```

If you're not using a raspbian-based distribution, you might get an error message like this:

```
You appear to be trying to update firmware on an incompatible distribution.
```

In this case use the following command:

```
sudo -E RPI_UPDATE_UNSUPPORTED=0 rpi-update
```

Configuring the sound card in OpenElec using device-tree-overlays

If you are either using OpenElec 6 (Isengard) or using a Raspberry Pi 2 with OpenElec 5.0.8 then you should configure OpenElec using device-tree overlay.

Login to your OpenElec system using ssh

When you first boot you should enable **SSH** when the *Welcome to OpenElec* wizard is displayed. You can enable **SSH**, later, via the OpenElec settings.

The SSH login details are

Login: *root* Password: *openelec*

Make /flash writeable

Once logged in via SSH the disk partition mounted under the *//flash* directory needs to be made writeable. Run the following command in the SSH console to do this:

```
mount -o remount,rw /flash
```

Edit config.txt

Edit the configuration text file *//flash/config.txt* using an available text editor, such as nano or vi.

Add the following lines, depending on the type of sound card, to *config.txt*.

DAC

```
dtoverlay=hifiberry-dac
```

```
dtdebug=1
```

DAC+

```
dtoverlay=hifiberry-dacplus
```

```
dtdebug=1
```

Digi/Digi+

```
dtoverlay=hifiberry-digi
```

```
dtdebug=1
```

Save the changes to *config.txt* and then reboot your OpenElec machine.

If the sound card isn't recognized after the reboot, check the log output via the command:

```
vcdbg log msg
```

Select the sound card

Once rebooted, navigate the OpenElec menu to **System → Settings** to show the **Change Your Settings** panel. Select the **System** submenu followed by the **Audio output** page. From the **Audio output device** select the ALSA enabled PiFi sound card. All sound will now go to the PiFi sound card's output.

Mixer control for DAC+

OpenElec seems to set the mixer to 100% by default. This can result in distortions of the music output. Therefore you should set this to around 80%. Login and use the following command:

```
amixer -c 0 set Digital 80%
```

You may want to experiment with the percentage volume in order to tune it to your desired preference.