# Contents

## 1 Contents

1.1 Introduction ......................................................... 3
1.2 Installation ......................................................... 3
  1.2.1 Requirements .................................................. 4
  1.2.2 Installation .................................................... 4
1.3 Usage ................................................................. 4
  1.3.1 Python API ..................................................... 4
  1.3.2 Command line interface ........................................ 5
  1.3.3 Graphical user interface ....................................... 6
1.4 API reference ........................................................ 8
1.5 Changes ............................................................... 9
  1.5.1 2.0.0 .......................................................... 9
  1.5.2 1.8.1 .......................................................... 10
  1.5.3 1.8.0 .......................................................... 10
  1.5.4 1.7.1 .......................................................... 10
  1.5.5 1.7.0 .......................................................... 10
  1.5.6 1.6.0 .......................................................... 10
  1.5.7 1.5.0 .......................................................... 10
  1.5.8 1.4.0 .......................................................... 11
  1.5.9 1.3.1 .......................................................... 11
  1.5.10 1.3.0 ......................................................... 11
  1.5.11 1.2.1 ........................................................ 11
  1.5.12 1.2.0 ........................................................ 11
  1.5.13 1.1.0 ........................................................ 11
  1.5.14 1.0.0 ........................................................ 11
1.6 License ............................................................... 12

## 2 Indices and tables

**Python Module Index** ................................................. 15

**Index** ........................................................................ 17
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1.1 Introduction

When I bought the official Raspberry Pi 7” touch LCD, I was quite happy about it - with one exception: *you can’t change the display brightness in a simple way out of the box.*

I did some research and hacked some Python code together. Time passed by, and the whole project turned into a Python module: `rpi-backlight`.

Currently it has the following features:

- Change the display brightness **smoothly** or **abrupt**
- Set the display power on or off
- Get the current brightness
- Get the maximum brightness
- Get the display power state (on/off)
- Command line interface
- Graphical user interface

Now you are able to easily set the brightness of your display from the command line, a GUI and even Python code!

1.2 Installation

This section covers the installation of the library on the Raspberry Pi.
1.2.1 Requirements

- A Raspberry Pi including a correctly assembled 7” touch display v1.1 or higher (look on the display’s circuit board to see its version) running a Linux-based OS. Alternatively you can use rpi-backlight-emulator on all operating systems and without the actual hardware.
- Python 3.5+
- Optional: pygobject for the GUI, already installed on a recent Raspbian

1.2.2 Installation

Note: This library will not work with Windows IoT, you’ll need a Linux distribution running on your Raspberry Pi. This was tested with Raspbian 9 (Stretch) and 10 (Buster).

rpibacklight is available on PyPI, so you can install it using pip3:

```bash
$ pip3 install rpi_backlight
```

Note: Create this udev rule to update permissions, otherwise you’ll have to run Python code, the GUI and CLI as root when changing the power or brightness:

```bash
$ echo 'SUBSYSTEM=="backlight",RUN=="/bin/chmod 666 /sys/class/backlight/%k/˓
_brightness /sys/class/backlight/%k/bl_power"' | sudo tee -a /etc/udev/rules.d/
˓
--backlight-permissions.rules
```

rpibacklight is now installed. See Usage to get started!

1.3 Usage

1.3.1 Python API

Make sure you’ve installed the library correctly.

Open a Python shell and import the Backlight class:

```python
>>> from rpi_backlight import Backlight
```

Create an instance:

```python
>>> backlight = Backlight()
```

Now you can get and set the display power and brightness:

```python
>>> backlight.brightness
100
>>> backlight.brightness = 50
>>> backlight.brightness
50
>>> with backlight.fade(duration=1):
...    backlight.brightness = 0
```

(continues on next page)
>>> backlight.fade_duration = 0.5
>>> # subsequent `backlight.brightness = x` will fade 500ms
>>> backlight.power
True
>>> backlight.power = False
>>> backlight.power
False
>>> 
See the API reference for more details.

### 1.3.2 Command line interface

Open a terminal and run `rpi-backlight`.

```bash
$ rpi-backlight -b 100
$ rpi-backlight --set-brightness 20 --duration 1.5
$ rpi-backlight --get-brightness 20
$ rpi-backlight --get-power on
$ rpi-backlight --p off
$ rpi-backlight --get-power off
$ rpi-backlight --set-power off :emulator:
$
```

You can set the backlight sysfs path using a positional argument, set it to `:emulator:` to use with `rpi-backlight-emulator`.

Available options:

```
                   [-p VALUE] [-d DURATION] [-V]
                   [SYSFS_PATH]

Get/set power and brightness of the official Raspberry Pi 7" touch display.

positional arguments:
SYSFS_PATH        Optional path to the backlight sysfs, set to
                 :emulator: to use with rpi-backlight-emulator

optional arguments:
-h, --help         show this help message and exit
--get-brightness   get the display brightness (0-100)
-b VALUE, --set-brightness VALUE
                   set the display brightness (0-100)
--get-power        get the display power (on/off)
-p VALUE, --set-power VALUE
                   set the display power (on/off)
-d DURATION, --duration DURATION
                   fading duration in seconds
-V, --version      show program's version number and exit
```

### 1.3. Usage

5
1.3.3 Graphical user interface

Open a terminal and run `rpi-backlight-gui`.

![rpi-backlight GUI](image)

Adding a shortcut to the LXDE panel

First, create a `.desktop` file for `rpi-backlight` (e.g. `/home/pi/.local/share/applications/rpi-backlight.desktop`) with the following content:

```
[Desktop Entry]
Version=1.0
Type=Application
Terminal=false
Name=rpi-backlight GUI
Exec=/home/pi/.local/bin/rpi-backlight-gui
Icon=/usr/share/icons/HighContrast/256x256/status/display-brightness.png
Categories=Utility;
```

The absolute path to `rpi-backlight-gui` might differ if you did not follow the installation instructions exactly, e.g. installed as root.

Make it executable:

```
$ chmod +x /home/pi/.local/share/applications/rpi-backlight.desktop
```

You should now be able to start the `rpi-backlight` GUI from the menu: (Raspberry Pi Logo) → Accessoires → `rpi-backlight` GUI.

Next, right-click on the panel and choose Add / Remove panel items. Select Application Launch Bar and click Preferences:
Select `rpi-backlight GUI` on the right and click `Add`: 
1.4 API reference

```python
class rpi_backlight.Backlight (backlight_sysfs_path: Union[str, bytes, pathlib.Path] = '/sys/class/backlight/rpi_backlight/')

Main class to access and control the display backlight power and brightness.

Set `backlight_sysfs_path` to ":emulator:" to use with rpi-backlight-emulator.

**brightness**
The display brightness in range 0-100.

```bash
>>> backlight = Backlight()
>>> backlight.brightness  # Display is at 50% brightness
50
>>> backlight.brightness = 100  # Set to full brightness
```

**Getter**  Return the display brightness.

**Setter**  Set the display brightness.

**Type**  float

**fade (duration: float) → None**
Context manager for temporarily changing the fade duration.
```python
>>> backlight = Backlight()
>>> with backlight.fade(duration=0.5):
...    backlight.brightness = 1  # Fade to 100% brightness for 0.5s
...  
>>> with backlight.fade(duration=0):
...    backlight.brightness = 0  # Set to 0% brightness without fading, use
"""if you have set `backlight.fade_duration` > 0"
```

### fade_duration

The brightness fade duration in seconds, defaults to 0. Also see `fade()`.

```python
>>> backlight = Backlight()
>>> backlight.fade_duration  # Fading is disabled by default
0
>>> backlight.fade_duration = 0.5  # Set to 500ms
```

- **Getter** Return the fade duration.
- **Setter** Set the fade duration.
- **Type** float

### power

Turn the display on and off.

```python
>>> backlight = Backlight()
>>> backlight.power  # Display is on
True
>>> backlight.power = False  # Turn display off
```

- **Getter** Return whether the display is powered on or off.
- **Setter** Set the display power on or off.
- **Type** bool

### 1.5 Changes

#### 1.5.1 2.0.0

- New, more pythonic API
- Update CLI and GUI
• Support emulator
• Add tests

1.5.2 1.8.1
• Fix float division issue with Python 2

1.5.3 1.8.0
• Fix permission error inconsistency across Python versions
• Update link to PyPI

1.5.4 1.7.1
• Fixed typo in \texttt{CHANGES.rst}
• Fixed rendering of parameters and return types in the documentation

1.5.5 1.7.0
• Fixed bug in \texttt{get\_power}, which would eventually always return False
• Added parameters and return types in docstrings

1.5.6 1.6.0
• \texttt{Added duration parameter} to \texttt{set\_brightness}
• \texttt{smooth} now defaults to \texttt{False}
• Huge improvements on CLI
• Fixed renamed function in examples
• Minor code and readme improvements

1.5.7 1.5.0
• PR #3 by Scouttp: Fixed permission errors
• Added documentation
• Code improvements
• Fixed typos
1.5.8 1.4.0

- Check for `pygobject` being installed
- Code cleanup
- README improvements
  - Added external links
  - Added badges
  - Fixed typos
- Moved to Travis CI and Landscape.io for builds and code health testing
- Prepared docs hosting at readthedocs.org

1.5.9 1.3.1

- Fixed type conversion

1.5.10 1.3.0

- Added experimental GUI (start with `rpi-backlight-gui`)

1.5.11 1.2.1

- Fixed CLI and typo

1.5.12 1.2.0

- Added command line interface (`rpi-backlight` and `rpi-backlight-gui`)
- Code improvements - thanks to deets

1.5.13 1.1.0

- Fixed `set_power(on)` function
- Added function to get the current power state of the LCD
- Added docstrings
- Code cleanup and improvements

1.5.14 1.0.0

Initial release. Added necessary files and basic features:
- Change the display brightness smoothly or abrupt
- Set the display power on or off
- Get the current brightness
• Get the maximum brightness

1.6 License

The rpi-backlight source code is distributed under the terms of the MIT license, see below:

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CHAPTER 2

Indices and tables

• genindex
• modindex
• search
r

rpi_backlight, 8
rpi_backlight.cli, 9
rpi_backlight.gui, 9
rpi_backlight.utils, 9
Index

B
Backlight \textit{(class in rpi\_backlight)}, 8
brightness \textit{(rpi\_backlight.Backlight attribute)}, 8

F
fade() \textit{(rpi\_backlight.Backlight method)}, 8
fade\_duration \textit{(rpi\_backlight.Backlight attribute)}, 9
FakeBacklightSysfs \textit{(class in rpi\_backlight.utils)}, 9

M
main() \textit{(in module rpi\_backlight/cli)}, 9
main() \textit{(in module rpi\_backlight/gui)}, 9

P
power \textit{(rpi\_backlight.Backlight attribute)}, 9

R
rpi\_backlight \textit{(module)}, 8
rpi\_backlight.cli \textit{(module)}, 9
rpi\_backlight.gui \textit{(module)}, 9
rpi\_backlight.utils \textit{(module)}, 9