

Display Shield Raspberry Pi

construction and programming manual

Rev.	Date	Description
A	2017-01-18	First release
B	2020-09-08	Changed to Display Shield Version 2.x

1.) *Electrical connection*

1.1) *Raspberry Pi – RasPiBox Open 1.3.x*

Pin	Cable color	Raspberry Pi	Description
1	black	N.C.	Optional Interrupt line – not used ¹
2	brown	GPIO3	SCL – I2C clock
3	red	GPIO2	SDA – I2C data
4	orange	3,3V	3,3V power supply
5	yellow	GND	Ground connection

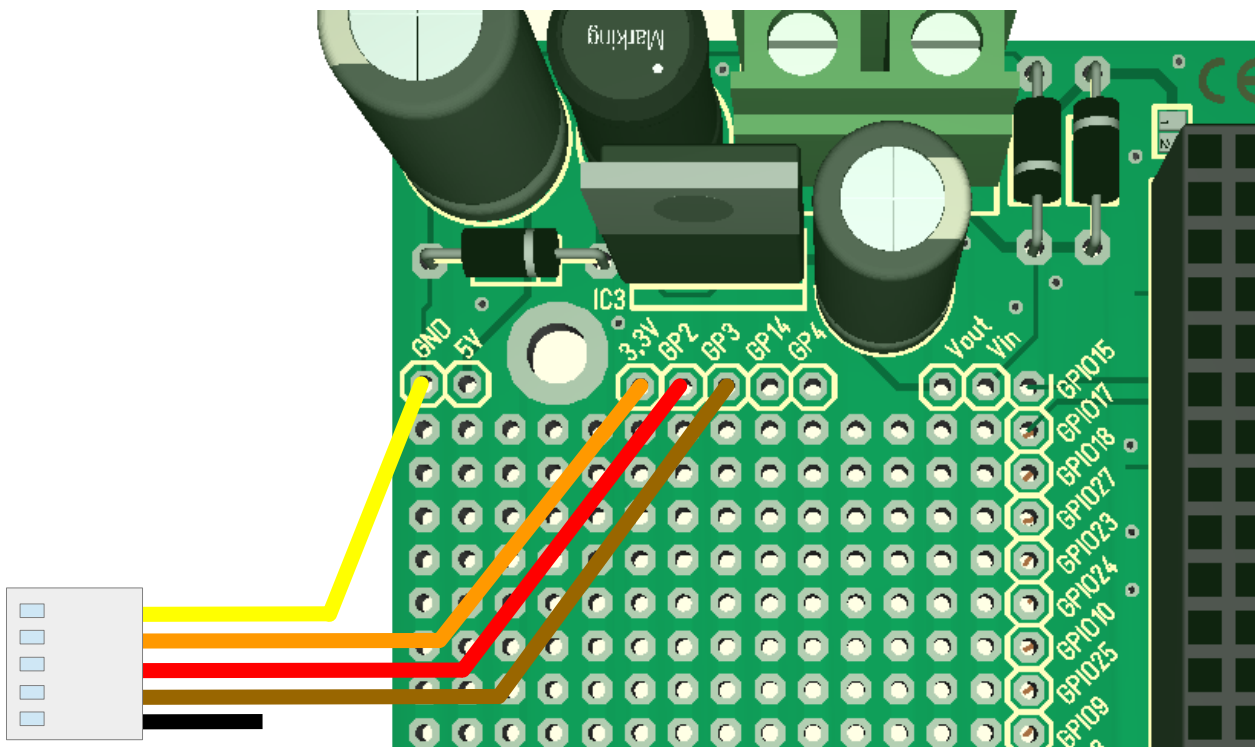


Fig 1: *Wiring example RasPiBox Open*

¹ If you want, you can connect this wire with a GPIO of your choice. In our programming example we don't use this line!

1.2) Raspberry Pi Zero – RasPiBox Zero 4.x

Pin	Cable color	Pi Zero	Description
1	black	N.C.	Optional Interrupt line – not used ²
2	brown	GPIO3	SCL – I2C clock
3	red	GPIO2	SDA – I2C data
4	orange	3,3V	3,3V power supply
5	yellow	GND	Ground connection

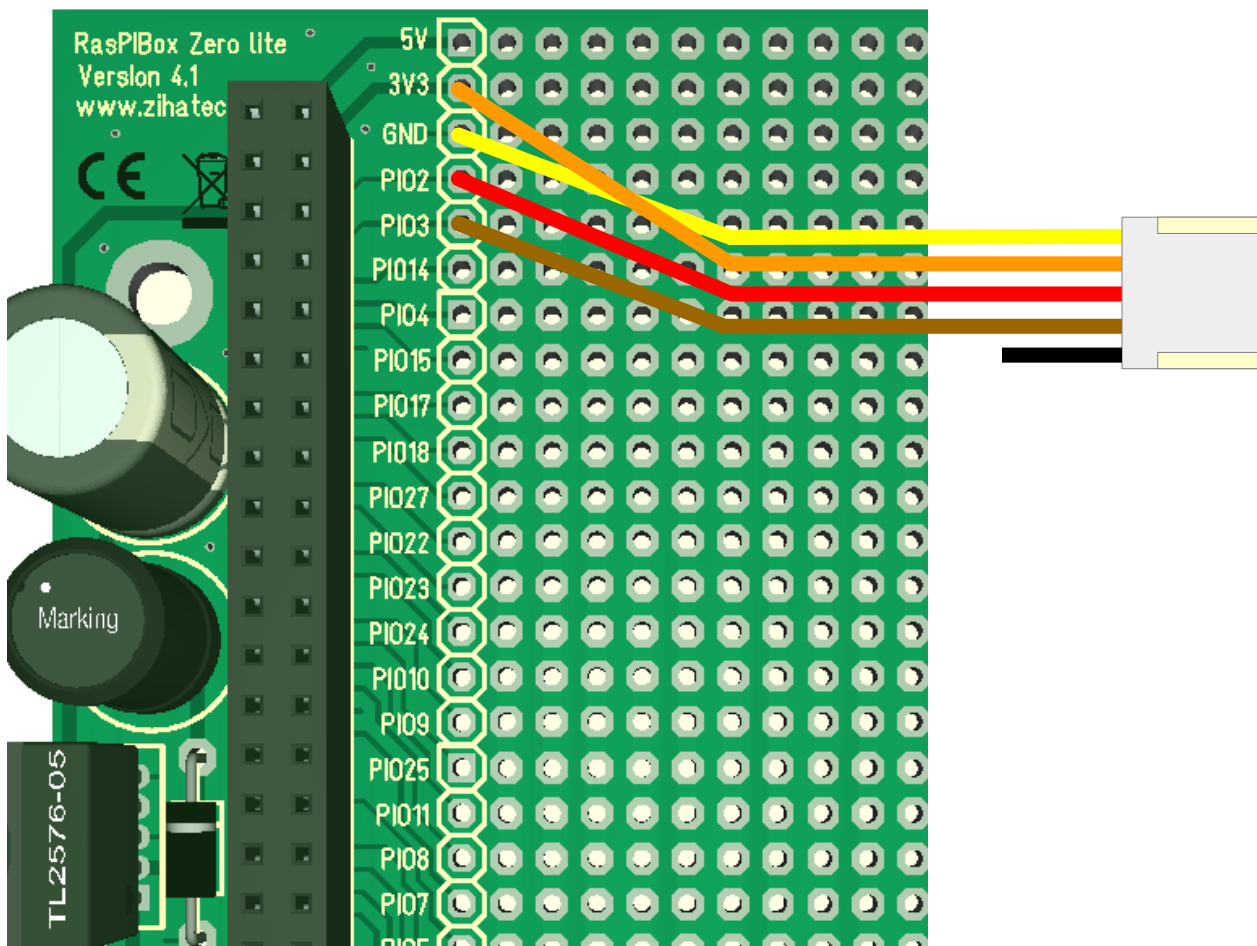
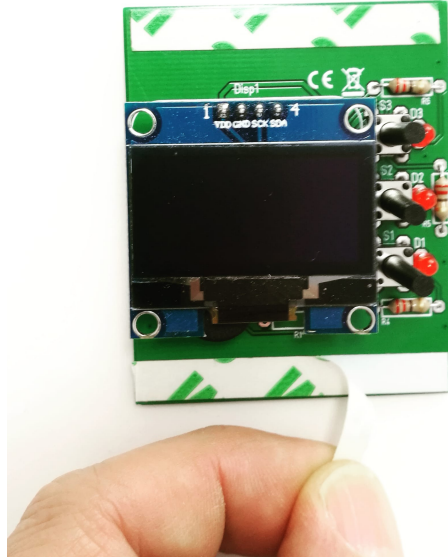


Abbildung 1: Wiring example for RasPiBox Zero Lite V4.x

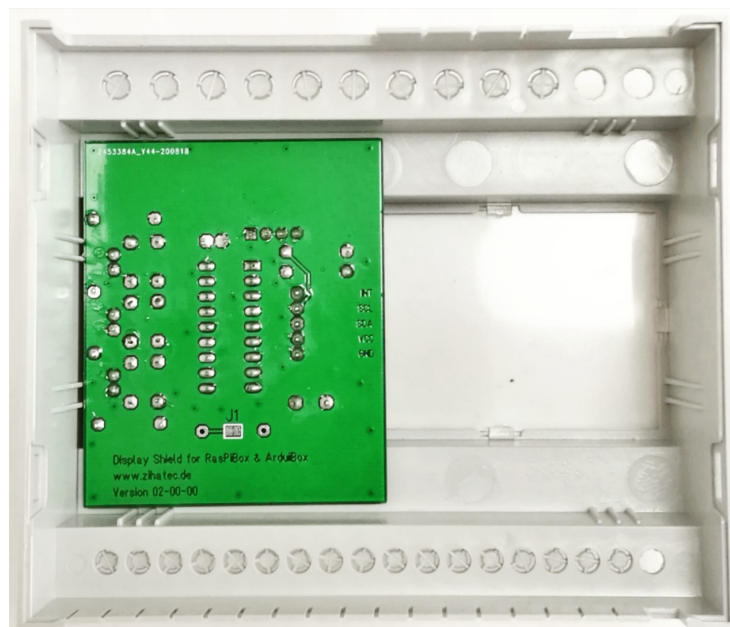
² If you want, you can connect this wire with a GPIO of your choice. In our programming example we don't use this line!

2.) *Mechanical assembly in RasPiBox enclosure*

Remove the protection foil from the double adhesive tape first:



Glue the shield into the top shell:



Place it exactly as in the picture above and close as possible to the left wall!

3.) *Programming in Python*

Before using the library you will need to make sure you have a few dependencies installed. Connect to your device using SSH and follow the steps below.

First you have to enable the I2C port of the Raspberry Pi:

sudo raspi-config

→ 5 Interfacing Options

→ P5 I2C

→ Would you like the ARM I2C interface to be enabled? → Yes

sudo reboot

Now you have to install the I2C tools:

sudo apt-get install i2c-tools -y

Now you can test the I2C interface:

i2cdetect -y 1

```
pi@raspberrypi:~$ sudo i2cdetect -y 1
   0  1  2  3  4  5  6  7  8  9  a  b  c  d  e  f
00:  --  --  --  --  --  --  --  --  --  --  --  --  --  --  --
10:  --  --  --  --  --  --  --  --  --  --  --  --  --  --  --
20: 20  --  --  --  --  --  --  --  --  --  --  --  --  --  --
30:  --  --  --  --  --  --  --  --  --  --  -- 3c  --  --  --
40:  --  --  --  --  --  --  --  --  --  --  --  --  --  --  --
50:  --  --  --  --  --  --  --  --  --  --  --  --  --  --  --
60:  --  --  --  --  --  --  --  --  --  --  --  --  --  --  --
70:  --  --  --  --  --  --  --  --  --  --  --  --  --  --  --
```

0x3C is the address of the SH1106 controller and 0x20 is the address of the MCP23008

Now you have to install Python3, PIP3 and some dependencies:

sudo apt install python3-dev python3-pip libfreetype6-dev libjpeg-dev build-essential libopenjp2-7 libtiff5

and the luma driver library for the SH1106 controller too:

sudo -H pip3 install --upgrade luma.oled

For the MCP23008 we have to install the smbus library too:

sudo pip3 install smbus

Now to download and install the demo code for the display shield, execute the following commands:

```
cd ..  
git clone https://github.com/hwhardsoft/Display\_Shield\_RPI.git  
cd Display_Shield_RPI
```

(The code is available also on our website)

to run the demo enter for the standard version:

```
sudo python3 display_shield.py
```

Press the 3 buttons to view different screens!