

Using an OLED screen on a Raspberry Pi

Introduction of OLED screen

OLED (Organic Light-Emitting Diode), also known as organic electric laser display, organic light-emitting semiconductor (Organic Electroluminescence Display, OLED). OLED belongs to a current-type organic light-emitting device, which generates light through the injection and recombination of carriers, and the light-emitting intensity is proportional to the injected current. And the power consumption is relatively low.

OLED screens are more and more used in embedded electronic devices because of their small size, lightness and low power consumption. There are different types of OLED screens, and the colors displayed are also different. Commonly used ones are white display, blue display and yellow-blue two-color display. There are also various screen sizes and built-in driver chips. The commonly used driver interfaces are SPI and IIC. Introduced in this article is a 0.96-inch blue IIC driver screen, and its built-in driver chip is SSD1306.



Configure the environment and download the program

Download OLED code

In the Raspberry Pi enter:

```
sudo git clone https://github.com/adeept/adeept\_OLED.git
```

```
pi@raspberrypi:~ $  
pi@raspberrypi:~ $ sudo git clone https://github.com/adeept/adeept\_OLED.git  
Cloning into 'adeept_OLED'...  
remote: Enumerating objects: 10, done.  
remote: Counting objects: 100% (10/10), done.  
remote: Compressing objects: 100% (9/9), done.  
remote: Total 10 (delta 1), reused 10 (delta 1), pack-reused 0  
Unpacking objects: 100% (10/10), done.  
pi@raspberrypi:~ $
```

Install dependent libraries

In the Raspberry Pi enter:

```
sudo -H pip3 install luma.oled
```

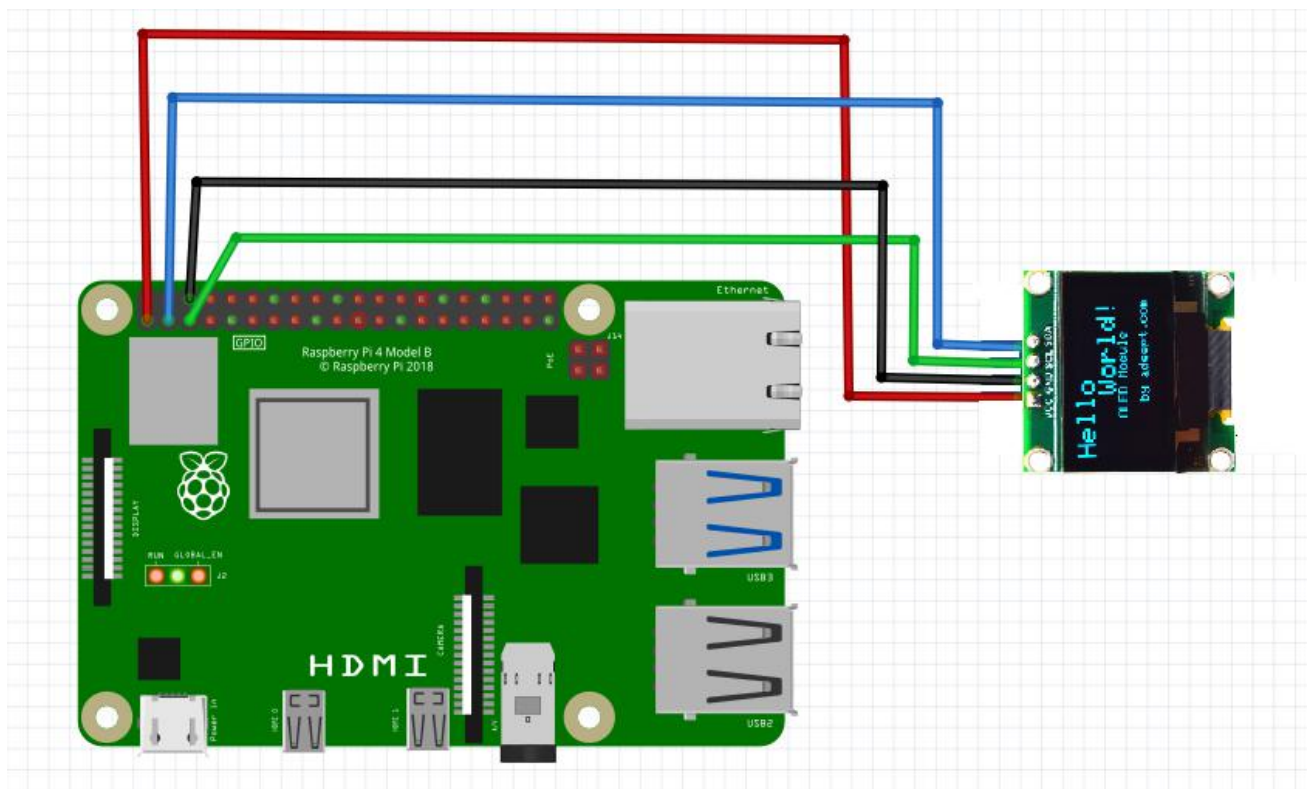
```
sudo -H pip3 install --upgrade luma.oled
```

```
sudo -H pip install picamera
```

Circuit diagram (wiring diagram)

When the OLED screen is in use, it needs to be connected to the IIC interface on the Raspberry Pi driver board, as shown below:

OLED screen pins	Raspberry Pi GPIO
VCC	3.3V
GND	GND
SCL	SCL1 (GPIO03)
SDA	SDA1 (GPIO02)





Run the program

The program is written via python3.

1. Enter the Raspberry Pi command line.

```
Linux raspberrypi 4.19.118-v7l+ #1311 SMP Mon Apr 27 14:26:42 BST 2020 armv7l
The programs included with the Debian GNU/Linux system are free software;
the exact distribution terms for each program are described in the
individual files in /usr/share/doc/*/copyright.
Debian GNU/Linux comes with ABSOLUTELY NO WARRANTY, to the extent
permitted by applicable law.
Last login: Sat Aug 29 08:17:49 2020 from 192.168.3.208
SSH is enabled and the default password for the 'pi' user has not been changed.
This is a security risk - please login as the 'pi' user and type 'passwd' to set
a new password.
pi@raspberrypi:~ $
```

2. Enter the command and press Enter to enter the folder where the program is located:

cd adeept_OLED

```
pi@raspberrypi:~ $
pi@raspberrypi:~ $ cd adeept_OLED/
pi@raspberrypi:~/adeept_OLED $
```

3. View the contents of the current directory file:

`ls`

```
pi@raspberrypi:~$  
pi@raspberrypi:~$ cd adeept_OLED/  
pi@raspberrypi:~/adeept_OLED$ ls  
1_hello_world.py 3_animated_gif.py 5_picamera_video.py  
2_pi_logo.py 4_picamera_photo.py images  
pi@raspberrypi:~/adeept_OLED$
```

4. Enter the command and press Enter to run the program:

`sudo python3 1_hello_world.py`

```
pi@raspberrypi:~/adeept_OLED$  
pi@raspberrypi:~/adeept_OLED$ sudo python3 1_hello_world.py  
█
```

5. After successfully running the program, you will observe that the words "Hello world!" will be displayed on the OLED screen.

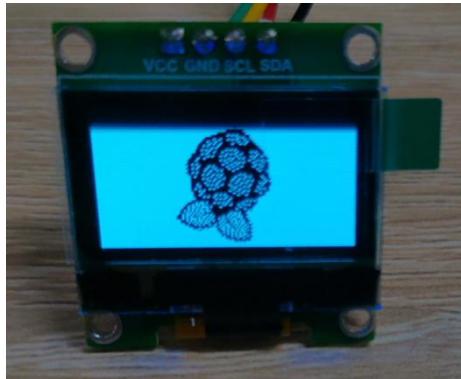


6. When you want to terminate an already running program, you can press the shortcut "Ctrl + C" on the keyboard.

Introduce other programs

`2_pi_logo.py`

Function: Display the logo pattern of Raspberry Pi on the OLED, and make the picture rotate.



3_animated_gif.py

Function: Display a GIF dynamic picture on the OLED.



4_picamera_photo.py

You need to connect the CSI camera to the Raspberry Pi. After running the program, it will take a picture and display it on the OLED. NOTE: Photos displayed on OLED are very low pixel.

5_picamera_video.py

You need to connect the CSI camera to the Raspberry Pi. After running the program, the image captured by the camera will be transmitted to the OLED for display. Note: The picture displayed on OLED is very low pixel.