

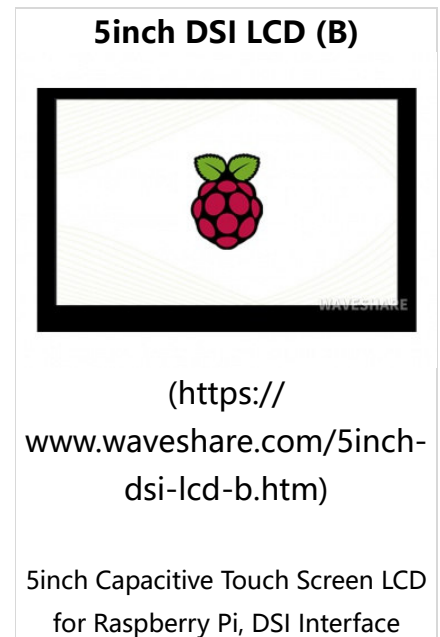
# 5inch DSI LCD (B)

From Waveshare Wiki

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## Features

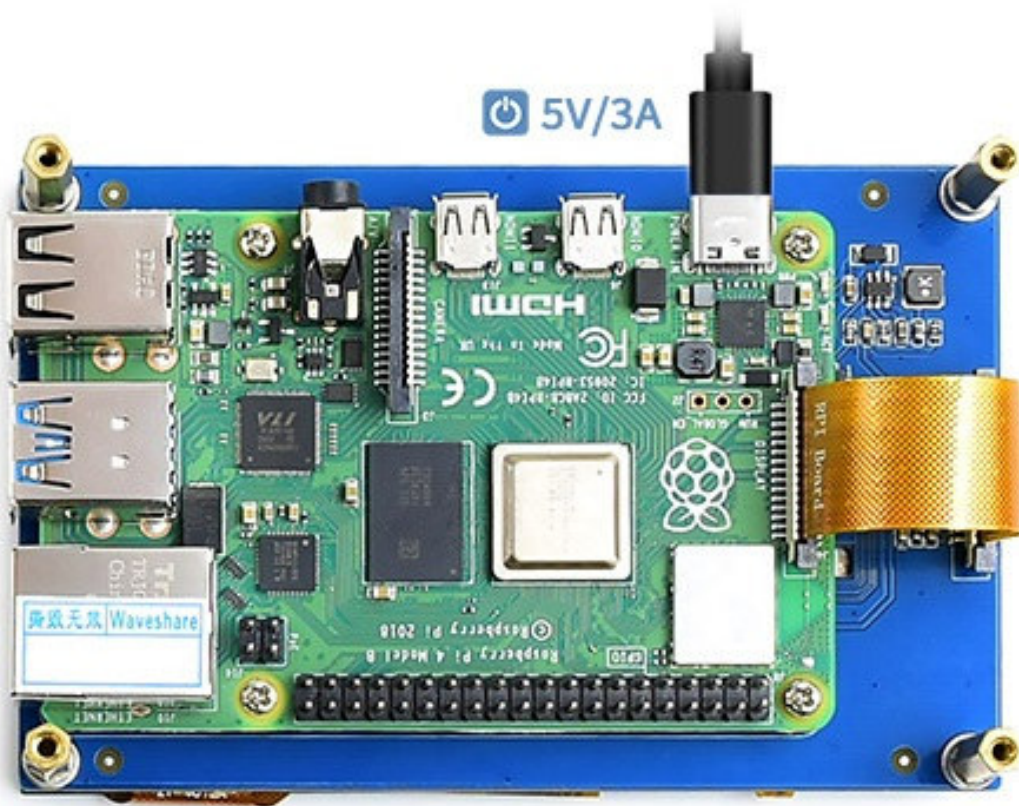
- 5inch IPS display screen, 800 x 480 hardware resolution.
- Capacitive touch panel, support 5-point touch.
- Toughened glass capacitive touch panel, hardness up to 6H.
- Supports Pi5/4B/CM4/3B+/3A+/3B/CM3/CM3+/2B/B+/A+.
- Directly drive the LCD by the DSI interface on the Raspberry Pi, with up to 60Hz refreshing rate.
- When working with Raspberry Pi, support Raspberry Pi OS / Ubuntu / Kali / Volumio and RetroPie, driver-free.
- When working with VisionFive 2, support Debian, single-point touch control, and driver-free.
- When working with Tinker Board 2, support Linux/Android, five-point touch control, and driver-free.
- When working with Core3566, support Debian/Ubuntu, five-point touch control, and driver-free.
- Support brightness adjustable through software control.



## Hardware Connection

### Work with Pi 4B/3B+/3A+/3B/2B/B+/A+

- Use an FFC cable to connect the 5-inch DSI LCD (B) to the 15-pin DSI interface on the Raspberry Pi board.
- For convenience, you can fix the Raspberry Pi on the backside of the 5-inch DSI LCD (B) with screws and assemble the copper column. As shown in the following figure:



(/wiki/File:4.3inch-

DSI-LCD-2.jpg)

## Work with Pi 5/CM4/CM3+/CM3

- Use a DSI-Cable-12cm cable to connect the 5-inch DSI LCD (B) to the 22-pin DSI1 interface on the Raspberry Pi board.
- For convenience, you can secure the Raspberry Pi 5 to the back of the 5-inch DSI LCD (B) using screws and assemble standoffs as shown in the following diagram:



(/wiki/

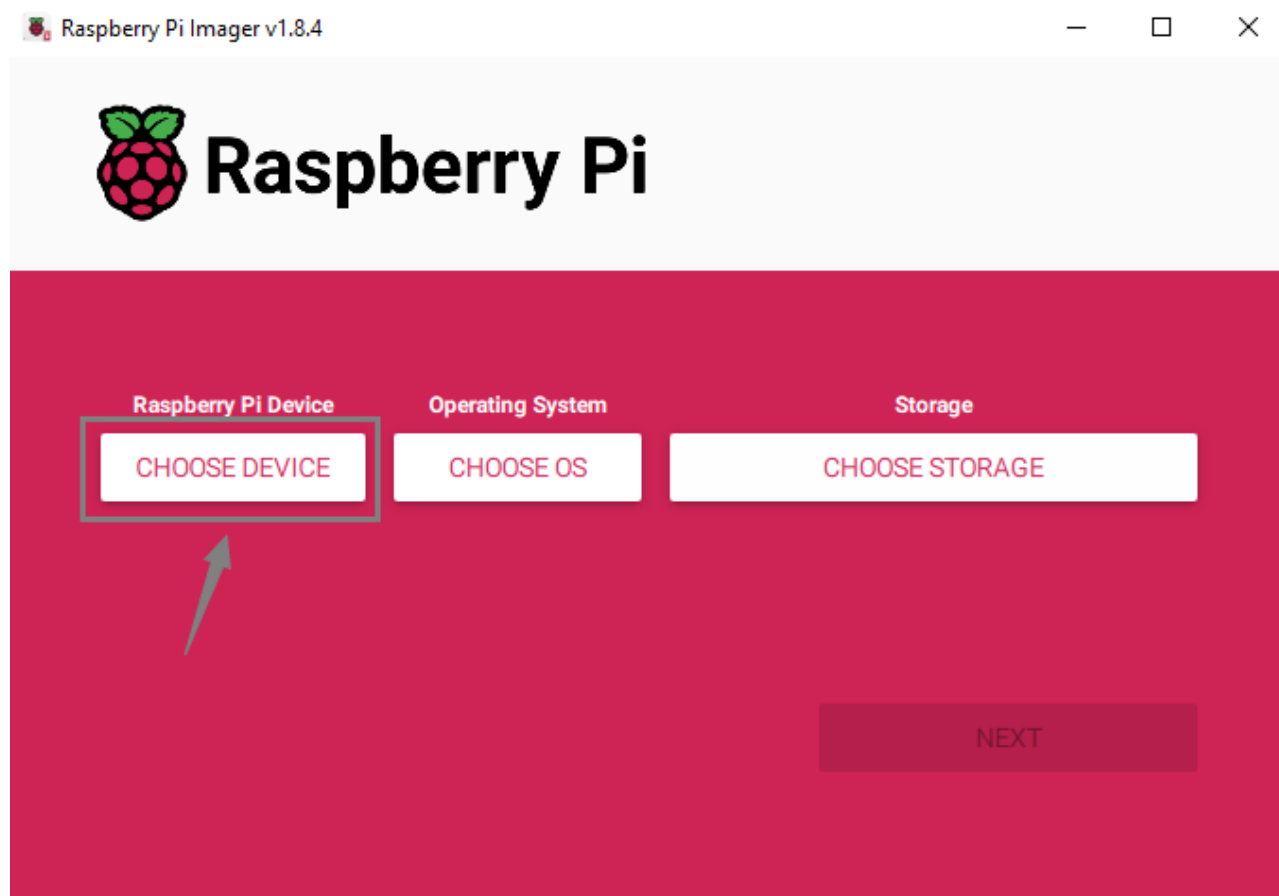
File:5inch\_DSI\_LCD\_(B)PI5.jpg)

## Software Setting

### Raspberry Pi OS Imager Installation

For Raspberry Pi OS/Ubuntu/Kali/Volumio and RetroPie system:

- 1. Connect the TF card to the PC, download and use Raspberry Pi Imager (<https://www.raspberrypi.com/software/>) to program the corresponding system image.



wiki/File:Pan-Tilt\_Camera\_WRITEIMAGE01.png)

- 2. After installing the imager, open the "config.txt" file on the TF card root directory, add the following codes at the end of "config.txt", and then save and safely remove the TF card.

```
dtoverlay=vc4-kms-v3d
#DSI1 Use
dtoverlay=vc4-kms-dsi-7inch
#DSI0 Use (Only Pi5/CM4)
#dtoverlay=vc4-kms-dsi-7inch,dsi0
```

- 3. Insert the TF card into the Raspberry Pi, power on the Raspberry Pi, wait for a few seconds normally, and then you can enter the display, and the system can be touched normally after booting.
- Note: For the Bookworm system on the Raspberry Pi 5, it is recommended to manually update to the latest system version and reboot (network connection is required).

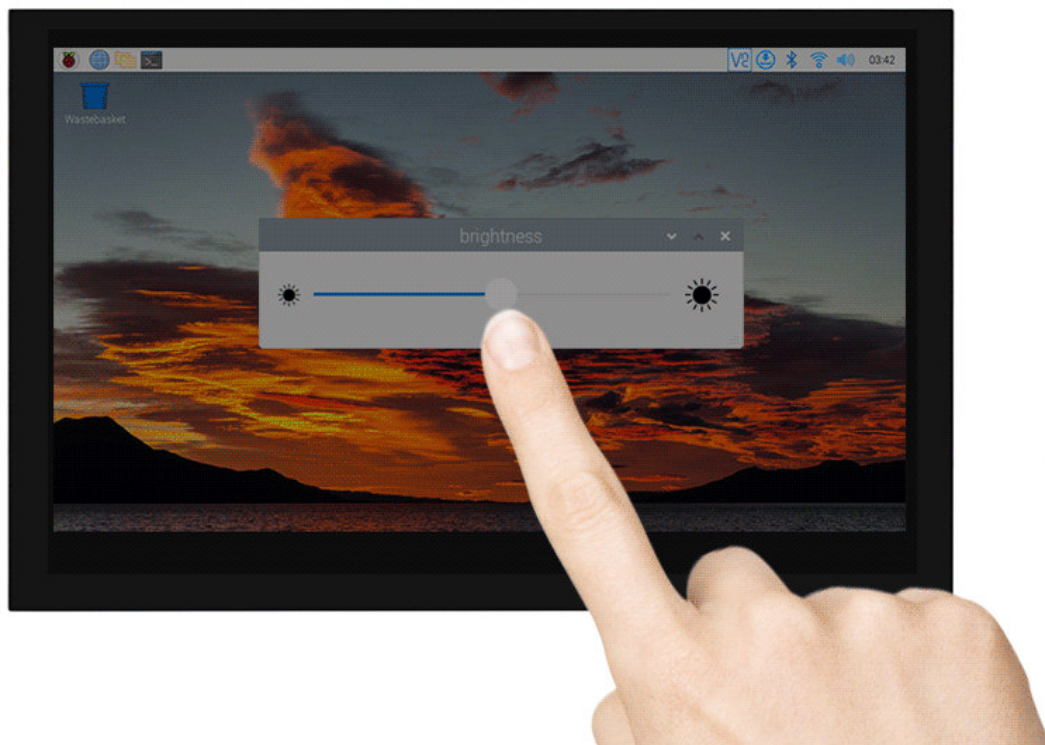
```
#Update the system
sudo apt-get update
sudo apt-get full-upgrade -y
#Reboot the system
sudo reboot
```

## Backlight Control

WaveShare provides the corresponding demo for the application (only supports Bookworm and Bullseye systems). Users can install it by the following commands:

```
wget https://files.waveshare.com/upload/f/f4/Brightness.zip (https://files.waveshare.com/upload/f/f4/Brightness.zip)
unzip Brightness.zip
cd Brightness
sudo chmod +x install.sh
./install.sh
```

After installation, you can open it: Menu -» Accessories -» Brightness:



(/wiki/File:43H-800480-IPS07.GIF)

In addition, you can also input the following commands to control the backlight brightness in the terminal:

```
echo X | sudo tee /sys/class/backlight/*/brightness
```

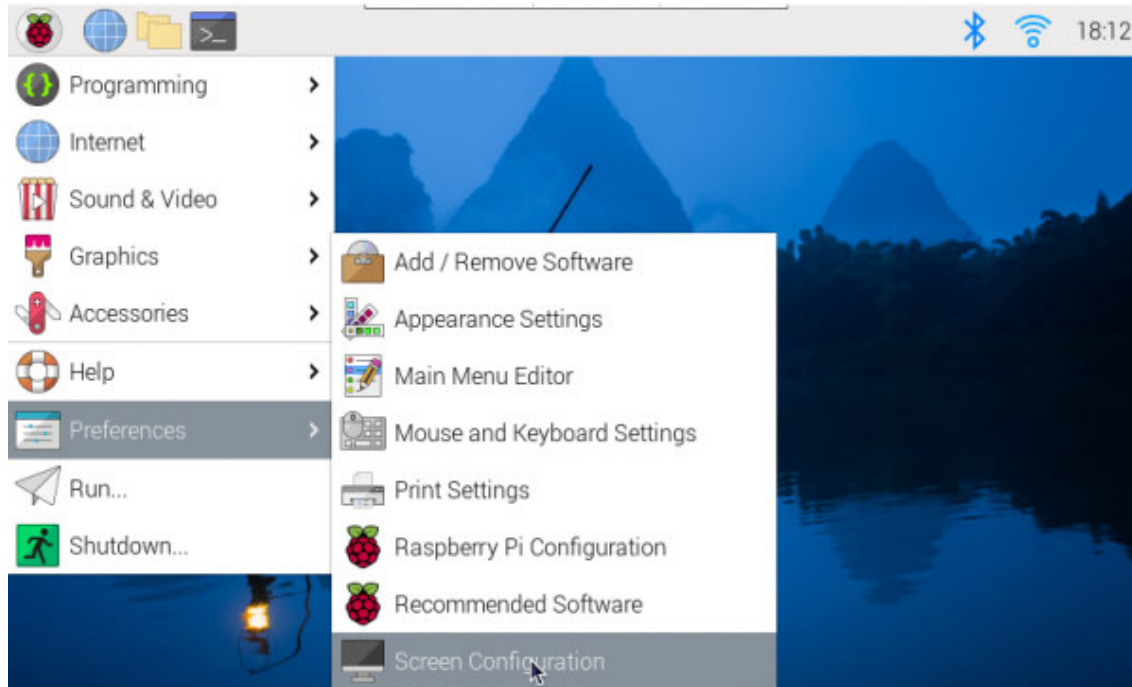
X indicates any number from 0 to 255. 0 means the backlight is the darkest, and 255 means the backlight is the brightest. For example:



```
echo 100 | sudo tee /sys/class/backlight/*/brightness  
echo 0 | sudo tee /sys/class/backlight/*/brightness  
echo 255 | sudo tee /sys/class/backlight/*/brightness
```

## Bookworm Touchscreen Rotation

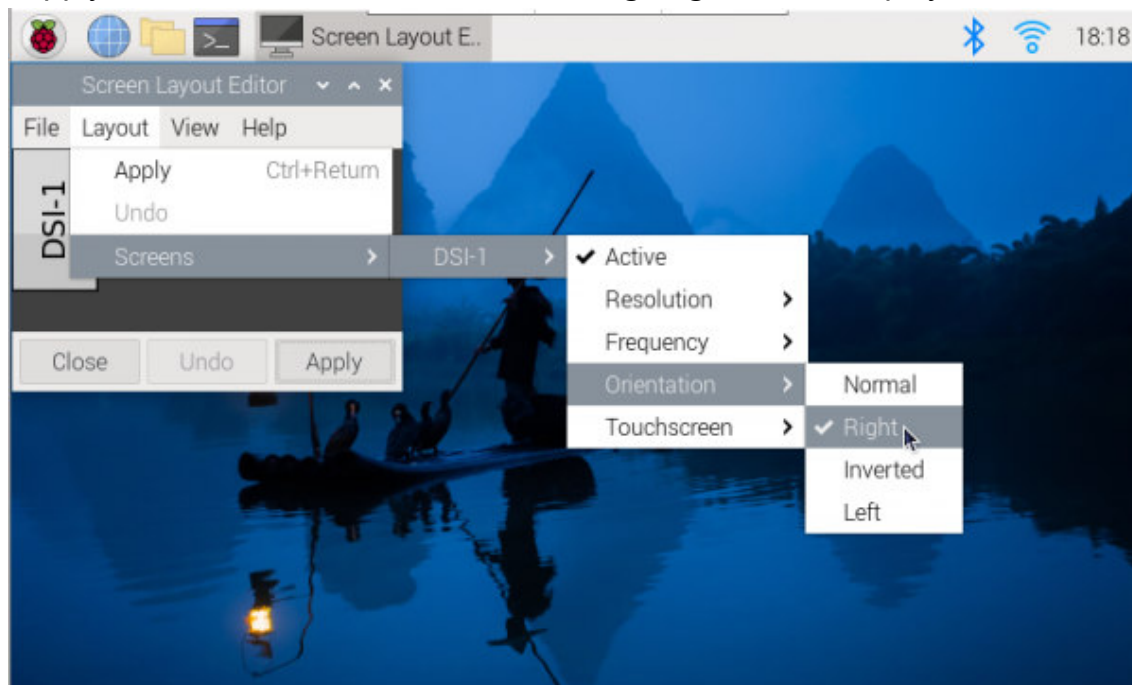
1. Open "Screen Configuration" application:



(/wiki/

File:DSI-LCD-Bookworm-Rotate-01.png)

2. Enter "Screen" -> "DSI-1" -> "Orientation", select the rotation orientation and click on "Apply". Then, the touch can be rotated aligning with the display.



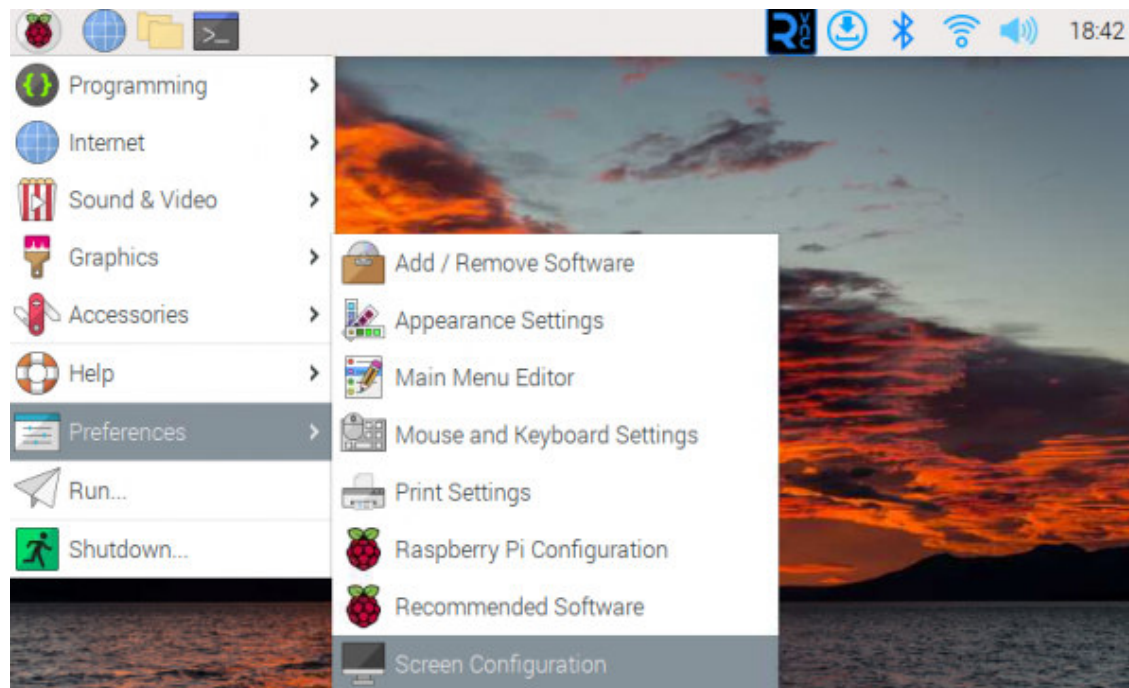
(/wiki/

File:DSI-LCD-Bookworm-Rotate-04.png)

**Note: Only the Bookworm system supports the above synchronous rotation method, for Bullseye and Butser systems, after the display rotates, you need to set the touch rotation additionally.**

## Bullseye/Buster Display Rotation

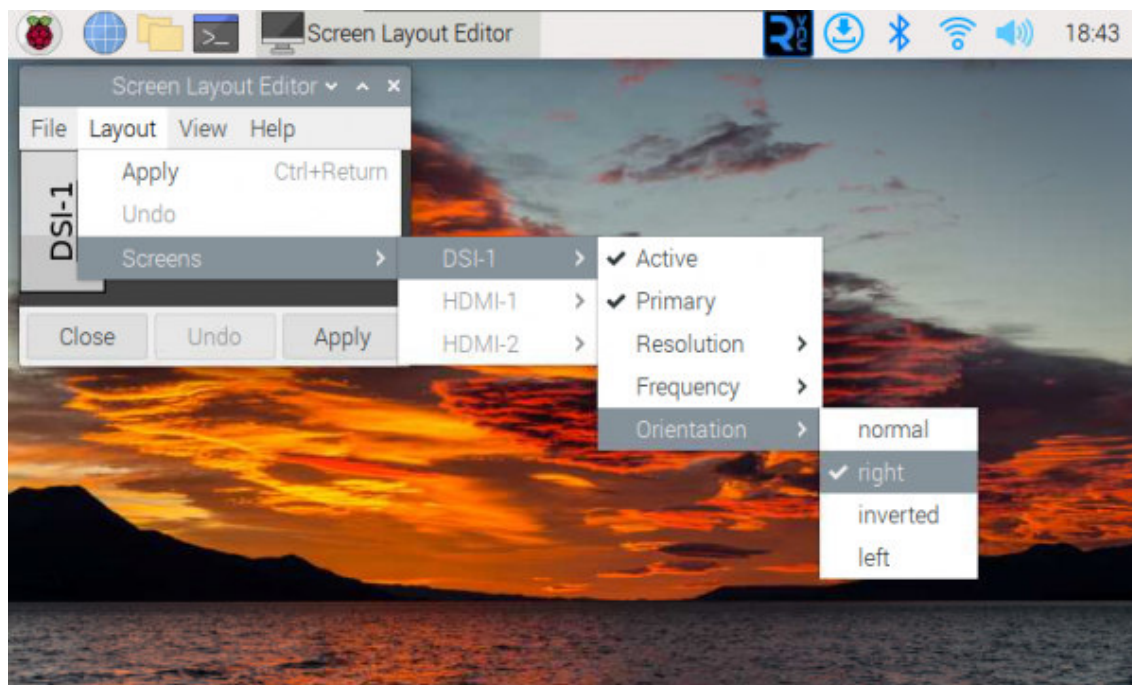
- 1. Open "Screen Configuration" application:



(/wiki/

File:DSI-LCD-Bullseye-Rotate-02.png)

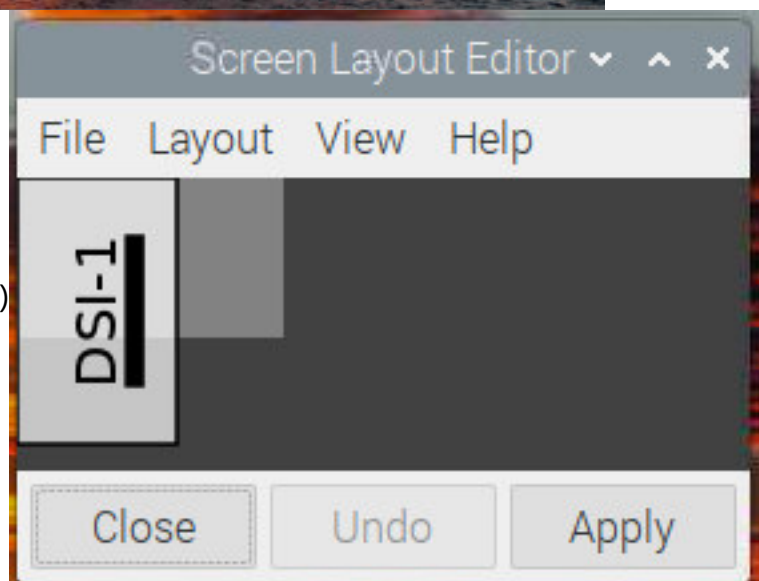
- 2. Enter "Screen"->"DSI-1"->"Orientation", select the rotation direction, and then click on "Apply" to complete the display rotation.



(/wiki/

File:DSI-LCD-Bullseye-Rotate-03.png)

(/



wiki/File:DSI-LCD-Bullseye-Rotate-04.png)

## Stretch/Jessie Display Rotation

**For some older systems, which do not use the `vc4-kms-v3d` or `vc4-fkms-v3d` driver modes, the display rotation method is as follows:**

- 1. Add statements to the `config.txt` file (the config file is located in the root directory of the TF card, i.e. `/boot`):

```
display_rotate=1 #1: 90; 2: 180; 3: 270
```

- 2. Just save and reboot the Raspberry Pi:



```
sudo reboot
```

## lite Version Display Rotation

① For Bookworm system, you need to modify the ".config/wayfire.ini" file:

```
sudo nano .config/wayfire.ini
#Compile [output:<device>] in wayfire.ini file, if it does not exist, you need add a new
[output:<device>], for example:
[output:DSI-1]
mode = 800x480@60049
position = 0,0
transform = normal
```

Modify the transform value to change the rotation angle. You can change it to normal and rotate 90, 180 or 270 degrees. For systems with kernel version 6.6.20 or higher, touch will follow the rotation after the change.

② For Bullseye or Buster system, you need to modify the "/boot/cmdline.txt" file:

```
sudo nano /boot/cmdline.txt
#Add the command to display the rotation angle at the beginning of the cmdline.txt file,
save and reboot to take effect
#Display rotates 90°
video=DSI-1:800x480M@60,rotate=90
#Display rotates 180°
video=DSI-1:800x480M@60,rotate=180
#Display rotates 270°
video=DSI-1:800x480M@60,rotate=270
```

## Touch Rotation

**For some systems, as the touch direction is different after display rotation, you need to rotate the touch as shown below:**

1. Install libinput:

```
sudo apt-get install xserver-xorg-input-libinput
```

- If the system you installed is an Ubuntu system, or Jetson Nano, the installation command is:

```
sudo apt install xserver-xorg-input-synaptics
```

2. Create the xorg.conf.d directory under /etc/X11/ (if this directory already exists, go directly to step 3):

```
sudo mkdir /etc/X11/xorg.conf.d
```

3. Copy "40-libinput-conf" file to the directory just created:

```
sudo cp /usr/share/X11/xorg.conf.d/40-libinput.conf /etc/X11/xorg.conf.d/
```

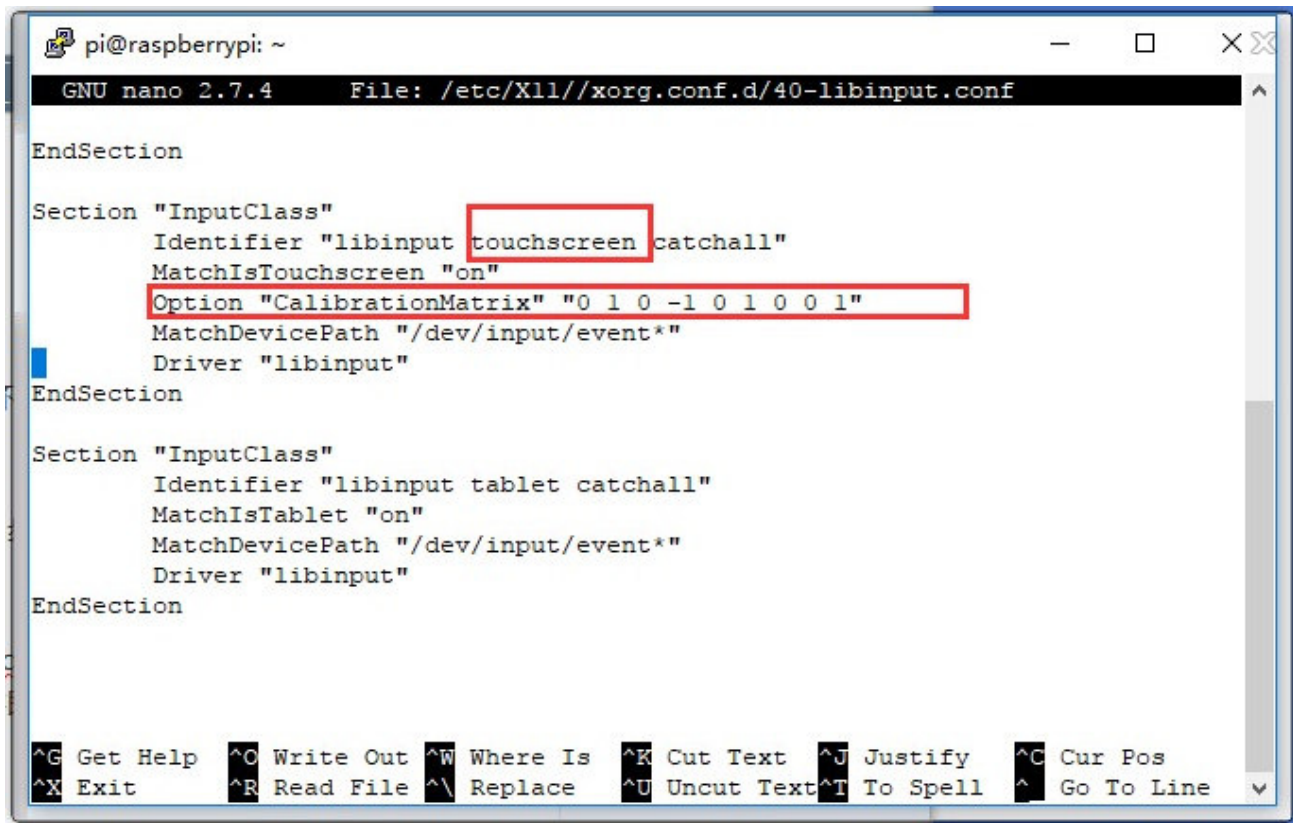
4. Edit:

```
sudo nano /etc/X11/xorg.conf.d/40-libinput.conf
```

Find the touchscreen part, add the following sentence, and then save.

```
#Find the touchscreen part, add the corresponding rotation Angle command, and then save:  
#90°Right touch rotation:  
Option "CalibrationMatrix" "0 1 0 -1 0 1 0 0 1"  
#180° Inverted touch rotation:  
#Option "CalibrationMatrix" "-1 0 1 0 -1 1 0 0 1"  
#270° Left rotation:  
#Option "CalibrationMatrix" "0 -1 1 1 0 0 0 0 1"
```

As shown below:



```
pi@raspberrypi: ~
GNU nano 2.7.4 File: /etc/X11/xorg.conf.d/40-libinput.conf

EndSection

Section "InputClass"
    Identifier "libinput touchscreen catchall"
    MatchIsTouchscreen "on"
    Option "CalibrationMatrix" "0 1 0 -1 0 1 0 0 1"
    MatchDevicePath "/dev/input/event*"
    Driver "libinput"
EndSection

Section "InputClass"
    Identifier "libinput tablet catchall"
    MatchIsTablet "on"
    MatchDevicePath "/dev/input/event*"
    Driver "libinput"
EndSection

^G Get Help  ^O Write Out ^W Where Is  ^K Cut Text  ^J Justify   ^C Cur Pos
^X Exit      ^R Read File ^\ Replace   ^U Uncut Text ^T To Spell  ^_ Go To Line
```

(

wiki/File:Touch\_roate.jpg)

5. Reboot the Raspberry Pi:

```
sudo reboot
```

The touch will be rotated after completing the above steps.

## Sleep

Run the following commands on the Raspberry Pi terminal, and the screen will enter sleep mode:

```
xset dpms force off
```

**Note:** The above command is only for Bullseye and Buster systems.

## Disable touch

At the end of the config.txt file, add the following command corresponding to disabling touch (the config file is located in the root directory of the TF card and can also be accessed via the command: `sudo nano /boot/config.txt`):

```
disable_touchscreen=1
```

**Note: Reboot to take effect after adding the command.**

## Resources

### 3D Drawing

- 3D Drawing ([https://files.waveshare.com/upload/9/95/5inch\\_DSI\\_LCD\\_%28B%29.zip](https://files.waveshare.com/upload/9/95/5inch_DSI_LCD_%28B%29.zip))

### Software

- Raspberry Pi Imager (<https://www.raspberrypi.com/software/>)

## FAQ

### Question:What is the power consumption of 5inch DSI LCD (B)?

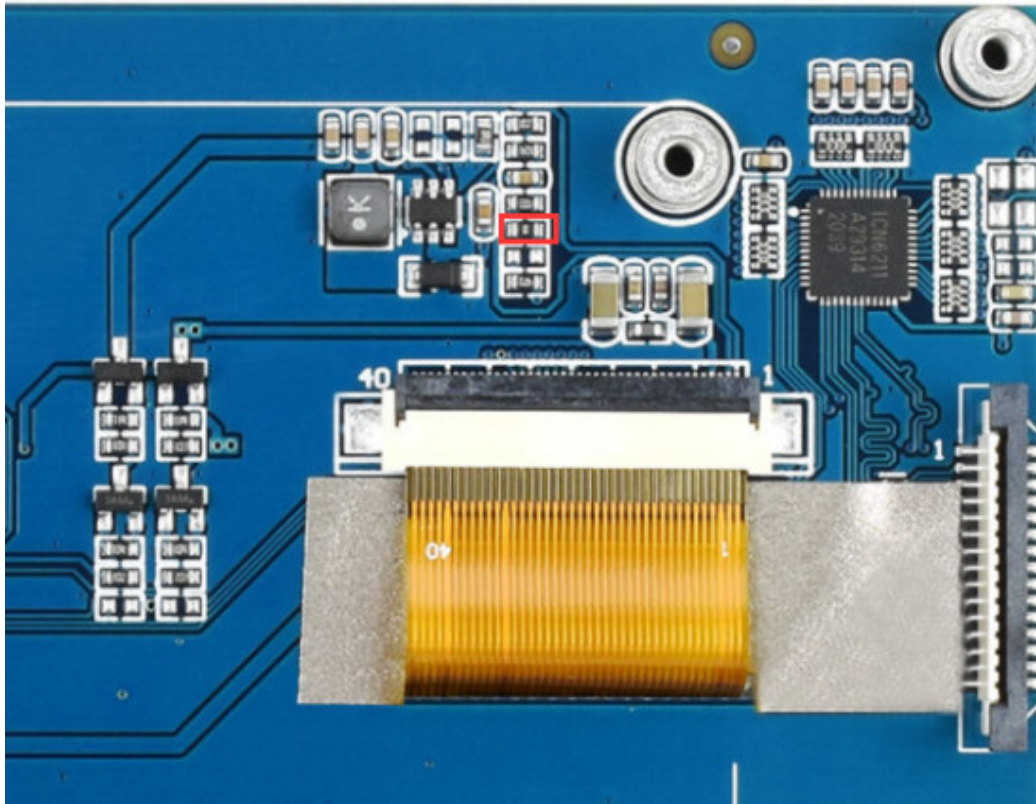
#### Answer:

Power the 5inch DSI LCD (B) using the Raspberry Pi's DSI interface, with a power consumption of approximately 1.3W.

### Question:Can a 5inch DSI LCD (B) control the backlight with an external PWM signal?

#### Answer:

The default state is to support software adjustment, it is recommended to view #Backlight Control, you can also weld PWM to control the backlight as follows:  
As shown in the figure below, first remove the original soldered resistor, and then connect the pad (left pad) of the resistor to the P1 pin of the Raspberry Pi, and you can use GPIO to control the backlight.

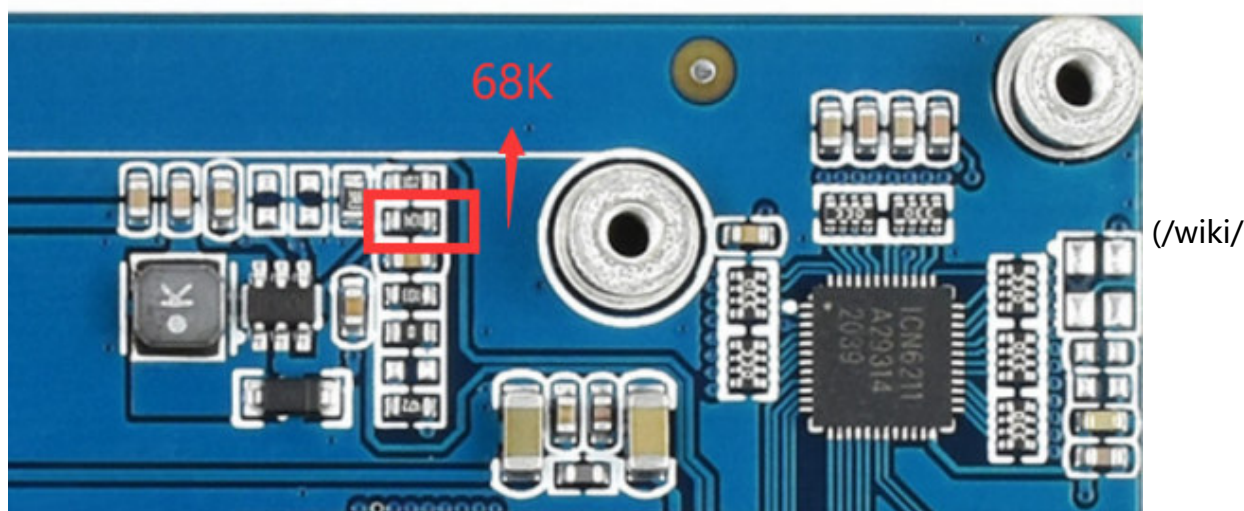


(/wiki/

File:5inch-DSI-faq.png)

- `gpio -g pwm 18 0`
- `gpio -g mode 18 pwm` (the occupied pins are PWM pins)
- `gpio pwmc 1000`
- Control brightness:
- `gpio -g pwm 18 X` (X is between 0 and 1024, 0 is the darkest, and 1024 is the brightest)
- PS: To ensure a good customer experience, the default factory minimum brightness is the visible state. If you need to completely turn off the backlight to achieve a black screen effect, please manually change the 100K resistor as shown below to a 68K resistor(Chip resistor 68K 0603  $\pm 1\%$ ) :





File:4.3DSI-brightness-2.png)

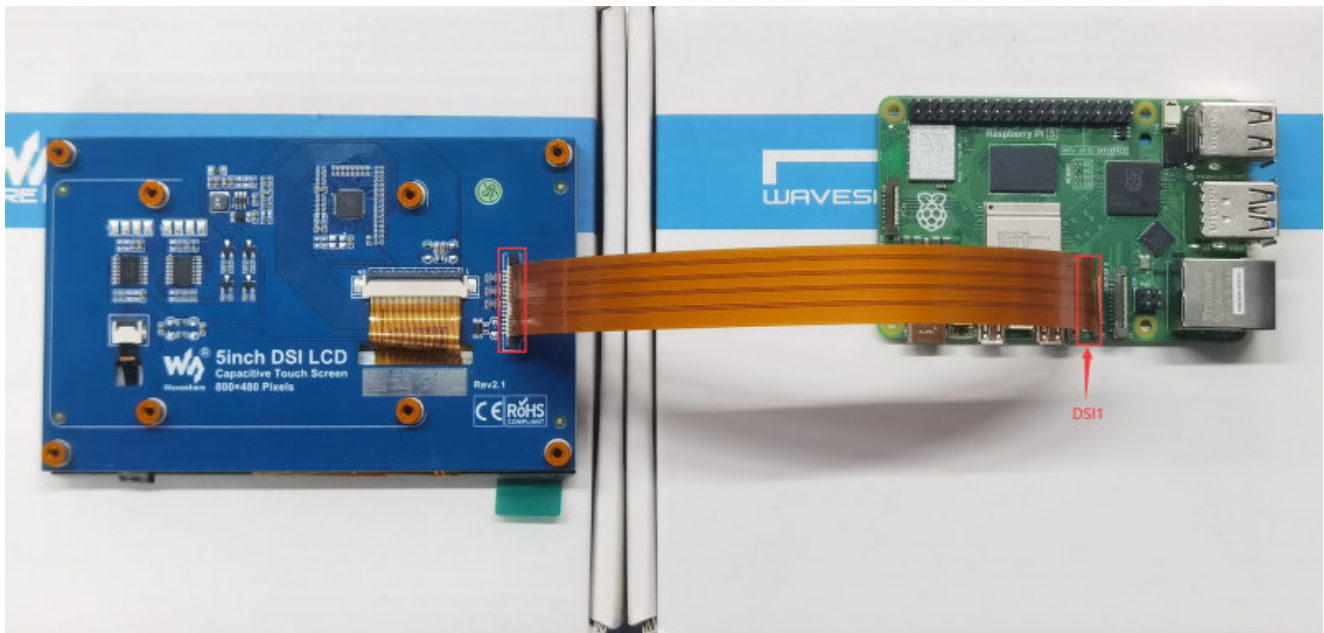
### Question:How to use 5inch DSI LCD (B) on Raspberry Pi 5?

#### Answer:

1. The hardware connection between DSI LCD and Pi5 as below:

- (1) A DSI cable (official Raspberry Pi cable or Waveshare Pi5-Display-Cable-200mm) for Pi 5 is required. Please ensure the proper orientation with the SODIMM.
- (2) Priority usage for Pi5's DSI1 interface.

If using the DSI0 interface, you need to add "dtoverlay=vc4-kms-dsi-7inch,dsi0" in the config.txt file



(/wiki/File:4.3inch\_DSI\_LCD-faq-20.png)

## 2. Check the DSI LCD version.

(1) The latest DSI LCD version compatible with Pi5 is Rev2.2, which can be directly used.

(2) If you purchased the product earlier, such as the Rev2.1 version (or older), due to the power detection mechanism of Pi5, it may misidentify the capacitors on the DSI LCD as a false short-circuit state, preventing the system from booting. In this situation, you can manually remove the large capacitors at the four positions marked in red circles in the image below.



(/wiki/

File:4.3inch\_DSI\_LCD-faq-21.png)

## 3. Software Setup:

For the Pi5, use the Bookworm system. (Please note, Pi5 currently only supports Bookworm, not Bullseye or Buster.)

(1) Connect the TF card to the PC, download and burn the corresponding system image using Raspberry Pi Imager (<https://www.raspberrypi.com/software/>).



wiki/File:7inch\_DSI\_LCD\_C\_Image.png)

(2) After the image is burned, open the config.txt file in the root directory of the TF card, add the following code at the end of the config.txt, save and safely eject the TF card.

```
dtoverlay=vc4-kms-v3d
#DSI1 Use
dtoverlay=vc4-kms-dsi-7inch
#DSI0 Use
#dtoverlay=vc4-kms-dsi-7inch,dsi0
```

(3) Connect the TF card to the Raspberry Pi, start the Raspberry Pi, and log in to the Raspberry Pi terminal (you can connect the Raspberry Pi to the HDMI display or log in remotely using ssh).

```
#Update system
sudo apt-get update
sudo apt-get full-upgrade -y
#Reboot system
sudo reboot
```

(4) Wait for the system restart, it will be able to display and touch normally.

Note that if use the DSI0 interface at the same time, you need to add the additional commands: "dtoverlay=vc4-kms-dsi-7inch,dsi0"

**Question: What screw size the columns use that are included?**

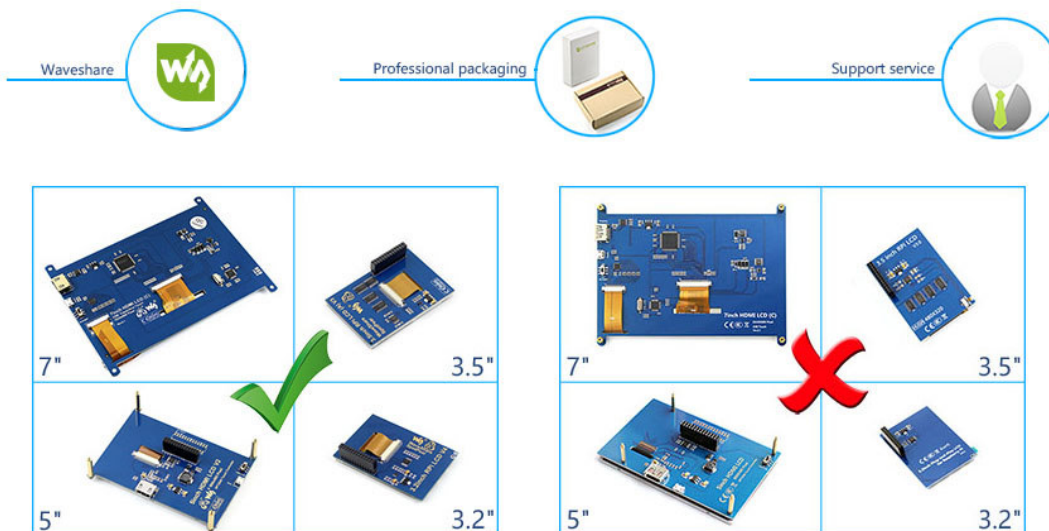
**Answer:**

Screw is M2.5.

## Anti-Piracy

Since the first-generation Raspberry Pi released, Waveshare has been working on designing, developing, and producing various fantastic touch LCDs for the Pi. Unfortunately, there are quite a few pirated/knock-off products in the market. They're usually some poor copies of our early hardware revisions, and comes with none support service.

To avoid becoming a victim of pirated products, please pay attention to the following features when purchasing:



([https://](https://www.waveshare.com/w/upload/6/6d/RPi-LCD-Anti-Piracy-l.jpg)

[www.waveshare.com/w/upload/6/6d/RPi-LCD-Anti-Piracy-l.jpg](https://www.waveshare.com/w/upload/6/6d/RPi-LCD-Anti-Piracy-l.jpg))

(Click to enlarge (<https://www.waveshare.com/w/upload/6/6d/RPi-LCD-Anti-Piracy-l.jpg>))

## Beware of knock-offs

Please note that we've found some poor copies of this item in the market. They are usually made of inferior materials and shipped without any testing.

You might be wondering if the one you're watching or you've purchased in other non-official stores is original, feel free to contact us.

## Support

### Technical Support

If you need technical support or have any feedback/review, please click the **Submit Now** button to submit a ticket, Our support team will check and reply to you within 1 to 2 working days. Please be patient as we make every effort to help you to resolve the issue.

Working Time: 9 AM - 6 PM GMT+8  
(Monday to Friday)

Submit Now (<https://service.waveshare.com/>)

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