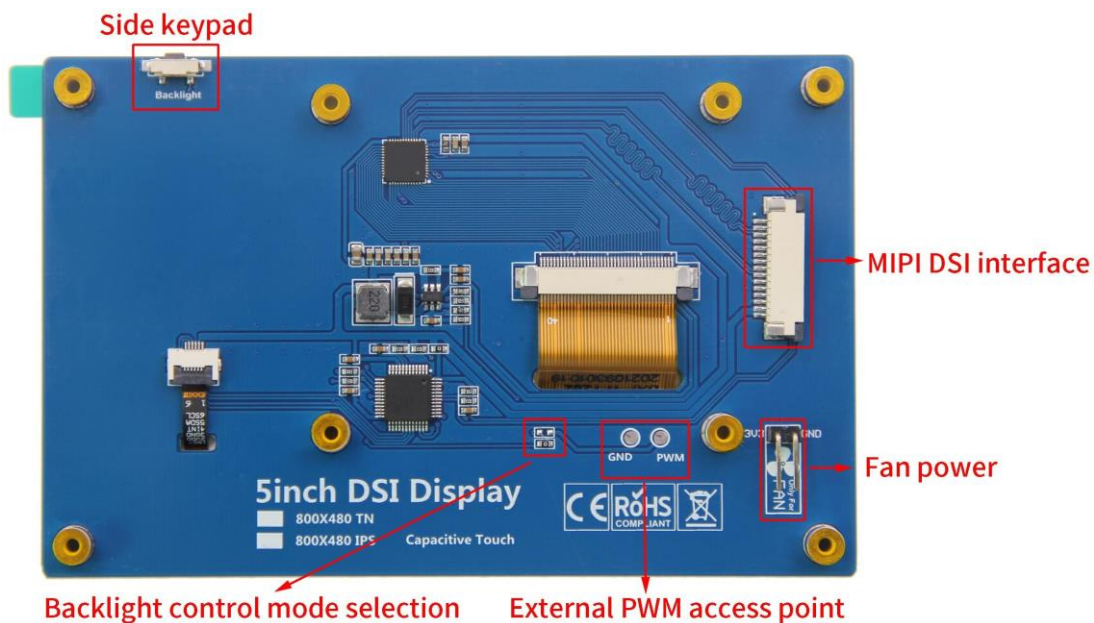


FREQUENTLY ASKED QUESTIONS

How to adjust Backlight Brightness

Method 1: Adjust by pressing buttons

Click the side keypad to increase by 10%, then return to 10% after reaching 100%; Long press to turn off the backlight and press again to restore the original brightness.



Method 2: Adjust by entering a command

1. Find the '**dtoverlay=vc4-kms-v3d**' in the /boot/config.txt file and comment it out ('**#dtoverlay=vc4-kms-v3d**').)

```
# Enable DRM VC4 V3D driver
#dtoverlay=vc4-kms-v3d
max_framebuffers=2
```

2. Permission needs to be granted first (only need to run once after each boot):

```
sudo chmod 777 /sys/class/backlight/rpi_backlight/brightness
```

3. Next step:

```
echo X > /sys/class/backlight/rpi_backlight/brightness
```

'X' indicates any number from 0 to 255. 0 indicates the darkest backlight, and 255 indicates the brightest backlight

(In this way, the brightness adjustment will be recorded in the system and will still take effect after the machine is restarted. The PWM mode is not recorded and changes with the signal in real time.)

Any concerns? [✉ support@freenove.com](mailto:support@freenove.com)

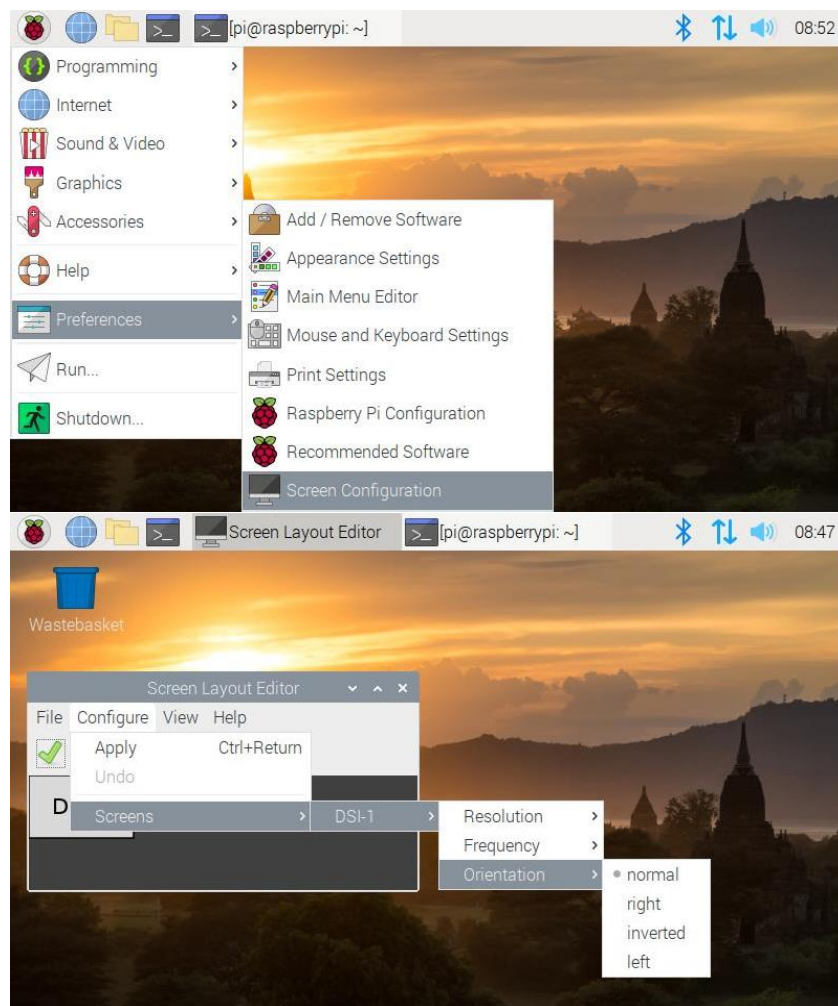
How to change the direction of the screen?

There are two modes to rotate the display direction: FKMS mode and traditional graphics mode.

Method 1: FKMS mode

FKMS mode is used by default on Raspberry Pi 4B. When using this mode, make sure that “**dtoverlay=vc4-fkms-v3d**” under pi4 in **/boot/config.txt** file is not commented out. In this mode, the display direction can only be rotated by menu options. Note that when setting the display direction in the menu, it is recommended to use the mouse for operation.

```
[pi4]
# Enable DRM VC4 V3D driver on top of the dispmanx display stack
dtoverlay=vc4-fkms-v3d
max_framebuffers=2
```



Method 2: Traditional graphics mode

By default, the Raspberry Pi 3, 2, and 1 series use traditional graphics mode. Raspberry Pi 4B can also use traditional graphics mode, just in **/boot/config.txt** file under the Pi 4:

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```
dtoverlay=vc4-fkms-v3d
```

Comment out, as shown (Traditional graphics mode is generally not recommended on Raspberry Pi 4B). In traditional graphics mode, this can be done by adding it at the end of the /boot/config.txt file:

```
display_lcd_rotate=x (x=0,1,2,3,0x10000,0x20000)
```

To set the display orientation, reboot is required to take effect.

```
[pi4]
# Enable DRM VC4 V3D driver on top of the dispmanx display stack
#dtoverlay=vc4-fkms-v3d
max_framebuffers=2
```

```
[all]
#dtoverlay=vc4-fkms-v3d
display_lcd_rotate=0
```

display_lcd_rotate=0, the default normal display direction (no rotation);
display_lcd_rotate=1, Rotate 90° clockwise;
display_lcd_rotate=2, Rotate 180° clockwise;
display_lcd_rotate=3, Rotate 270° clockwise;
display_lcd_rotate=0x10000, Flip horizontal;
display_lcd_rotate=0x20000, Flip vertical;

Note: There is a more convenient way to rotate display and touch at the same time by rotating 180° clockwise.

Please find the 'dtoverlay=vc4-fkms-v3d' in the /boot/config.txt file and comment it out '#dtoverlay=vc4-fkms-v3d', and add the following statement at the end of the file

```
display_rotate=2
lcd_rotate=2
```

```
# Additional overlays and parameters are documented /boot/overlays/README

# Enable audio (loads snd_bcm2835)
dtparam=audio=on

[pi4]
# Enable DRM VC4 V3D driver on top of the dispmanx display stack
#dtoverlay=vc4-fkms-v3d
max_framebuffers=2

[all]
#dtoverlay=vc4-fkms-v3d
hdmi_force_hotplug=1

display_rotate=2
lcd_rotate=2
```

After saving and restart, display and touch can be used normally (only rotate 180°, other directions are not applicable)

How to rotate the touch direction?

The display direction is set, and the touch direction should be set accordingly. It needs to correspond with the display direction; otherwise the touch operation is not accurate. Touch direction setting need to be in the

`/usr/share/X11/xorg.conf.d/40-libinput.conf` file add '`<Option "CalibrationMatrix" "XXX" >`' content, including XXX for touch direction set parameters, the following will show.

Open the **40-libinput.conf** file:

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

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

After the modification, press **Ctrl +X**, **Y**, and **Enter** to save and exit.

Corresponding relation table of display direction and touch direction:

Display Rotation	FKMS mode	Traditional graphics mode Settings	Touch orientation setting
no rotation	normal	display_lcd_rotate=0	Option "CalibrationMatrix" "1 0 0 0 1 0 0 0 1"
Rotate 90° clockwise	right	display_lcd_rotate=1	Option "CalibrationMatrix" "0 1 0 -1 0 1 0 0 1"
Rotate 180° clockwise	inverted	display_lcd_rotate=2	Option "CalibrationMatrix" "-1 0 1 0 -1 1 0 0 1"
Rotate 270° clockwise	left	display_lcd_rotate=3	Option "CalibrationMatrix" "0 -1 1 1 0 0 0 0 1"
Flip horizontal	NO	display_lcd_rotate=0x10000	Option "CalibrationMatrix" "-1 0 1 0 1 0 0 0 1"
Flip vertical	NO	display_lcd_rotate=0x20000	Option "CalibrationMatrix" "1 0 0 0 -1 1 0 0 1"