

How to use

This LCD can support Raspbian and Kali systems.

Please download the latest version of the image on the [Raspberry Pi official website](#).

- 1) Download the compressed file to the PC, and unzip it to get the .img file.
- 2) Connect the TF card to the PC, use SDFormatter.exe software to format the TF card.
- 3) Open the Win32DiskImager.exe software, select the system image downloaded in step 1, and click 'Write' to write the system image.
- 4) After the image has finished writing, open the config.txt file in the root directory of the TF card(/boot/), add the following code at the end of config.txt, then save and quit the TF card safely.

```
gpio=0-9=a2
gpio=12-17=a2
gpio=20-25=a2
dtoverlay=dpi24
enable_dpi_lcd=1
display default lcd=1
extra_transpose_buffer=2
dpi group=2
dpi mode=87
dpi_output_format=0x7F216
hdmi timings=480 0 26 16 10 640 0 25 10 15 0 0 0 60 0 32000000 1
dtoverlay=waveshare-28dpi-3b-4b
dtoverlay=waveshare-28dpi-3b
dtoverlay=waveshare-28dpi-4b
```

Note: For Raspberry Pi 4, you need to comment out `dtoverlay=vc4-fkms-V3D`.

5) Download the [File:28DPIB DTBO.zip](#) and extract 3 dtbo files. Copy these three files to the overlays directory (/boot/overlays/), as shown in the following figure:

6) Save and quit the TF card safely, and insert the TF card into the Raspberry Pi.

7) Insert the 4inch DPI LCD (B) into the 40PIN GPIO interface of the Raspberry Pi, power on the Raspberry Pi, and wait for about ten seconds to display normally.

Rotation(Working with Raspberry Pi)

Display Rotating

Add this statement in the config.txt file (the config file is located in the root directory of the TF card, which is named /boot/):

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

And then restart the Raspberry Pi after saving.

```
sudo reboot
```

Touch Rotating

After the display is rotated, the position of touch is incorrect because the touch doesn't change with the display angle. So the touch also needs to be modified.

1.Install libinput.

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

If the system you installed is Ubuntu or Jetson Nano. The installation code is:

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

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

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

3.Copy the 40-libinput-conf file to the directory you created just now.

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

4.Edit this file.

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

Find the part of the touchscreen, add the following statement inside, and then save the file.

```
Option "CalibrationMatrix" "0 1 0 -1 0 1 0 0 1"
```

Similar to the picture 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
```

5. save and reboot your Pi

```
sudo reboot
```

After completing these steps. The LCD could rotate 90 degrees both display and touch function.

Note:

90 degree: Option "CalibrationMatrix" "0 1 0 -1 0 1 0 0 1"

180 degree: Option "CalibrationMatrix" "-1 0 1 0 -1 1 0 0 1"

270 degree: Option "CalibrationMatrix" "0 -1 1 1 0 0 0 0 1"

Knob introduction

- **Backlight:** Adjust the screen brightness.
- **Volume:** Adjust the speaker volume.

Others

Disable power saving.

If you want to keep the display turning on all the time, you can disable the power saving function. Modify file lightdm.conf

```
sudo nano /etc/lightdm/lightdm.conf
```

Find the [SeatDefaults] option and uncomment the line"xserver-command", modify it as below:

```
#xserver-command=X
```

Modify this code to

```
xserver-command=X -s 0 -dpms
```

- -s # –Disable the display protecting.
- dpms Disable power saving.

Reboot

```
sudo reboot
```

Control brightness by PWM

Note: This method can only support Raspberry Pi 3B+ and the older version, it cannot support Pi 4.

```
gpio -g mode 18 pwm      #Configure the PWM pin
gpio pwm 100
gpio -g pwm 18 1023     #Set it brightest
gpio -g pwm 18 0        #Set it dimmest
gpio -g mode 18 out     #Free the pin and set it as output
```

Turn on/off the LCD

You can turn on/off the LCD with the following command.

Note: The command can only work when the PWM pin is free and in output mode.

```
sudo echo 1 | sudo tee /sys/class/backlight/rpi_backlight/bl_power
sudo echo 0 | sudo tee /sys/class/backlight/rpi_backlight/bl_power
```

Interface

PIN NO.	SYMBOL	DESCRIPTION
1	NC	Not connected
2	5V	5V power

3	VSYNC	Vertical synchronization
4	5V	5V Power
5	HSYNC	Horizontal synchronization
6	GND	Ground
7	B2	RGB signal lines
8	G4	RGB signal lines
9	GND	Ground
10	G5	RGB signal lines
11	G7	RGB signal lines
12	PWM	Backlight control (Pi4 can only turn on/off the backlight. Only the eralier versions support brightness adjustment with PWM)
13	TP_INT	Interrupt pin of touch panel
14	GND	Ground
15	R4	RGB signal lines
16	R5	RGB signal lines
17	NC	Not connected

18	R6	RGB signal lines
19	TP_SDA	The I2C SDA of touch panel
20	GND	Ground
21	B7	RGB signal lines
22	R7	RGB signal lines
23	TP_SCL	The I2C SCL of touch panel
24	B6	RGB signal lines
25	GND	Ground
26	B5	RGB signal lines
27	LCD_CLK	Clock pin of LCD panel
28	DE	Data enable of LCD panel
29	B3	RGB signal lines
30	GND	Ground
31	B4	RGB signal lines
32	G2	RGB signal lines

33	G3	RGB signal lines
34	GND	Ground
35	NC	Not connected
36	G6	RGB signal lines
37	NC	Not connected
38	R2	RGB signal lines
39	GND	Ground
40	R3	RGB signal lines