

# How to use

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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=dpi18
enable_dpi_lcd=1
display default lcd=1
extra_transpose_buffer=2
dpi group=2
dpi mode=87
dpi_output_format=0x6f006
hdmi timings=640 0 20 10 10 480 0 10 5 5 0 0 0 60 0 60000000 1
dtoverlay=waveshare-35dpi-3b-4b
dtoverlay=waveshare-35dpi-3b
dtoverlay=waveshare-35dpi-4b
```

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

- 5) Download the [3.5inch DPI LCD DTBO file](#) and extract 3 dtbo files. Copy these three files to the overlays directory (/boot/overlays/), as shown in the following figure:

<input type="checkbox"/> w1-gpio.dtbo	2020/5/27 11:22	DTBO 文件	2 KB
<input type="checkbox"/> w1-gpio-pullup.dtbo	2020/5/27 11:22	DTBO 文件	2 KB
<input type="checkbox"/> w5500.dtbo	2020/5/27 11:22	DTBO 文件	2 KB
<input type="checkbox"/> wittypi.dtbo	2020/5/27 11:22	DTBO 文件	2 KB
<input checked="" type="checkbox"/> waveshare-35dpi-3b.dtbo	2020/10/13 3:32	DTBO 文件	1 KB
<input checked="" type="checkbox"/> waveshare-35dpi-3b-4b.dtbo	2020/10/19 17:14	DTBO 文件	2 KB
<input checked="" type="checkbox"/> waveshare-35dpi-4b.dtbo	2020/10/13 3:32	DTBO 文件	1 KB

- 6) Save and quit the TF card safely, and insert the TF card into the Raspberry Pi.
- 7) Insert the 3.5inch DPI LCD 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)

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### 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 in 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"

## 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

If you use Pi4, you need to update wiringPi first:

```
wget https://project-downloads.drogon.net/wiringpi-latest.deb
sudo dpkg -i wiringpi-latest.deb
gpio -v
# Check if it is 2.52 version
```

### Control the brightness by PWM

```
gpio -g mode 18 pwm      #Configure the PIN as PWM mode
gpio pwmc 100
gpio -g pwm 18 0        #Brightest
gpio -g pwm 18 1023     #Dimmest
gpio -g mode 18 out     #Clear the PIN to output mode.
```

## Turn on/off HDMI output

You can use the following commands to disable/enable the displaying.

```
vcgencmd display_power 0
vcgencmd display_power 1
```

## Interface

The pins labeled "NC" below means that those pins of Raspberry Pi are not occupied by the LCD, and the user can use them for other applications.

PIN NO.	SYMBOL	DESCRIPTION
1	NC	Power positive (3.3V power input)
2	5V	Power positive (5V power input)

3	VSYNC	Vertical sync
4	5V	Power positive (5V power input)
5	HSYNC	Horizontal sync
6	GND	Ground
7	B0	RGB signal cable
8	G2	RGB signal cable
9	GND	Ground
10	G3	RGB signal cable
11	G5	RGB signal cable
12	AUDIO	Audio output
13	TP_INT	Touch Panel interrupt
14	GND	Ground
15	R2	RGB signal cable
16	R3	RGB signal cable
17	NC	Power positive (3.3V power input)

18	R4	RGB signal cable
19	TP_SDA	I2C SDA for touch panel
20	GND	Ground
21	B5	RGB signal cable
22	R5	RGB signal cable
23	TP_SCL	I2C SCL for touch panel
24	B4	RGB signal cable
25	GND	Ground
26	B3	RGB signal cable
27	LCD_CLK	LCD clock
28	DE	LCD data enable
29	B1	RGB signal cable
30	GND	Ground
31	B2	RGB signal cable
32	G0	RGB signal cable

33	G1	RGB signal cable
34	GND	Ground
35	NC	GPIO interface
36	G4	RGB signal cable
37	NC	GPIO interface
38	R0	RGB signal cable
39	GND	Ground
40	R1	RGB signal cable