

# How to change display direction

(GPIO-Resistive touch)

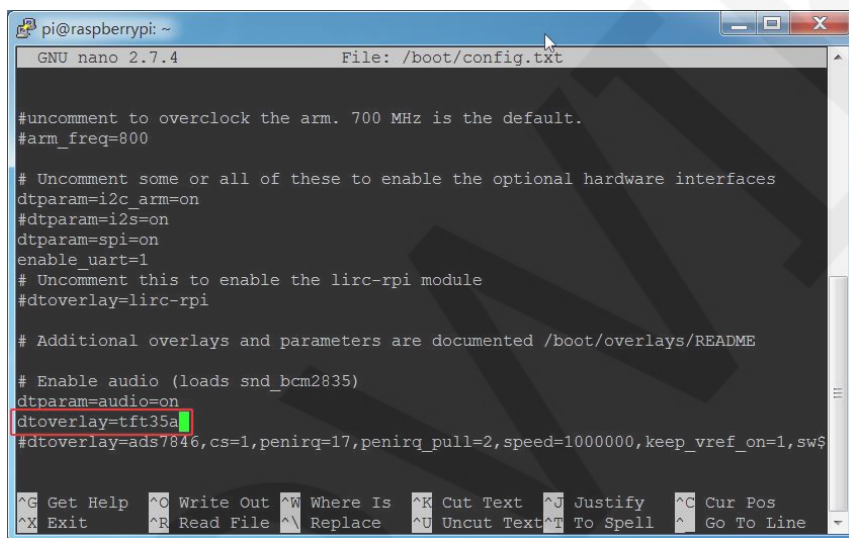
## 1. How does GPIO interface LCD rotate display

(Applicable to GPIO LCD(2.4, 2.8, 3.2 and 3.5 inches), not applicable to HDMI LCD)

1) Execute the command on the Raspberry Pi to open the **config.txt** file:

```
sudo nano /boot/config.txt
```

As following picture shows:



```
pi@raspberrypi: ~
GNU nano 2.7.4 File: /boot/config.txt

#uncomment to overclock the arm. 700 MHz is the default.
#arm_freq=800

# Uncomment some or all of these to enable the optional hardware interfaces
dtparam=i2c_arm=on
#dtparam=i2s=on
dtparam=spi=on
enable_uart=1
# Uncomment this to enable the lirc-rpi module
#dtoverlay=lirc-rpi

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

# Enable audio (loads snd_bcm2835)
dtparam=audio=on
dtoverlay=tft35a
#dtoverlay=ads7846,cs=1,penirq=17,penirq_pull=2,speed=1000000,keep_vref_on=1,sw9
```

2) If you use a 2.4-inch / 2.8-inch / 3.2-inch LCD, find the line  
"dtoverlay=tft9341" and add the rotate parameter as follows:

```
dtoverlay=tft9341:rotate=value
```

If you use a 3.5-inch LCD, find the line "dtoverlay=tft35a" and add rotate parameters in the following format:

```
dtoverlay=tft35a:rotate=value
```

(value = 0, 90, 180, 270)

Take 3.5inch RPi Display (MPI3501) as an example:

0 degrees of rotation:

```
dtoverlay=tft35a:rotate=0
```

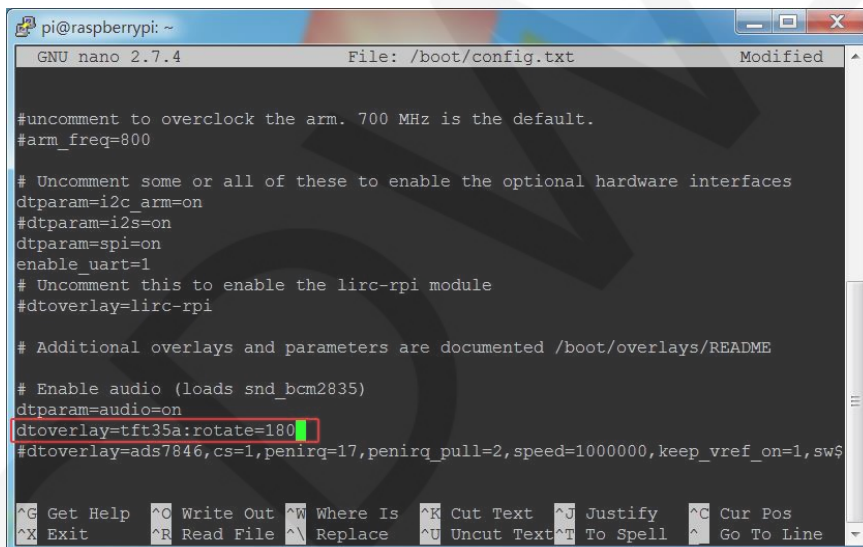
90 degrees of rotation (default display direction):

```
dtoverlay=tft35a:rotate=90
```

180 degrees of rotation:

```
dtoverlay=tft35a:rotate=180
```

As following picture shows:



```
pi@raspberrypi: ~
GNU nano 2.7.4 File: /boot/config.txt Modified

#uncomment to overclock the arm. 700 MHz is the default.
#arm_freq=800

# Uncomment some or all of these to enable the optional hardware interfaces
dtparam=i2c_arm=on
#dtparam=i2s=on
dtparam=spi=on
enable_uart=1
# Uncomment this to enable the lirc-rpi module
#dtoverlay=lirc-rpi

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

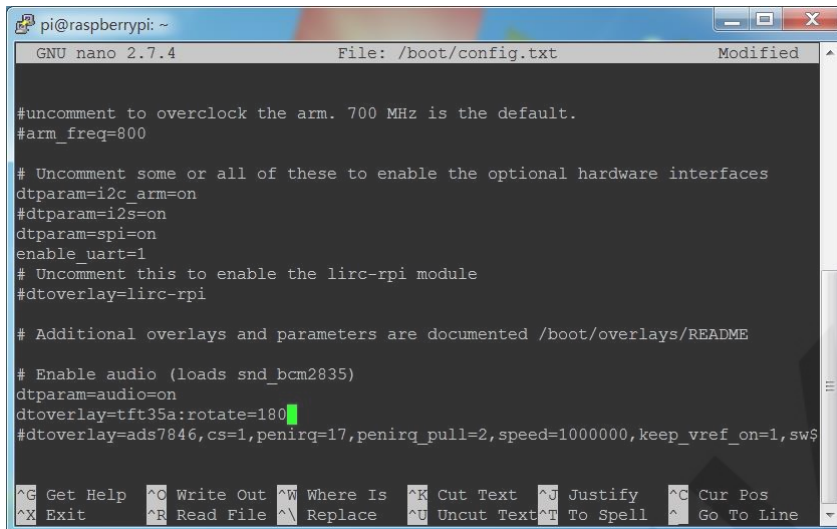
# Enable audio (loads snd_bcm2835)
dtparam=audio=on
dtoverlay=tft35a:rotate=180
#dtoverlay=ads7846,cs=1,penirq=17,penirq_pull=2,speed=1000000,keep_vref_on=1,sw$

^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
```

270 degrees of rotation:

```
dtoverlay=tft35a:rotate=270
```

Press **Ctrl + X**, quit;



```
pi@raspberrypi: ~
GNU nano 2.7.4 File: /boot/config.txt Modified
#uncomment to overclock the arm. 700 MHz is the default.
#arm_freq=800

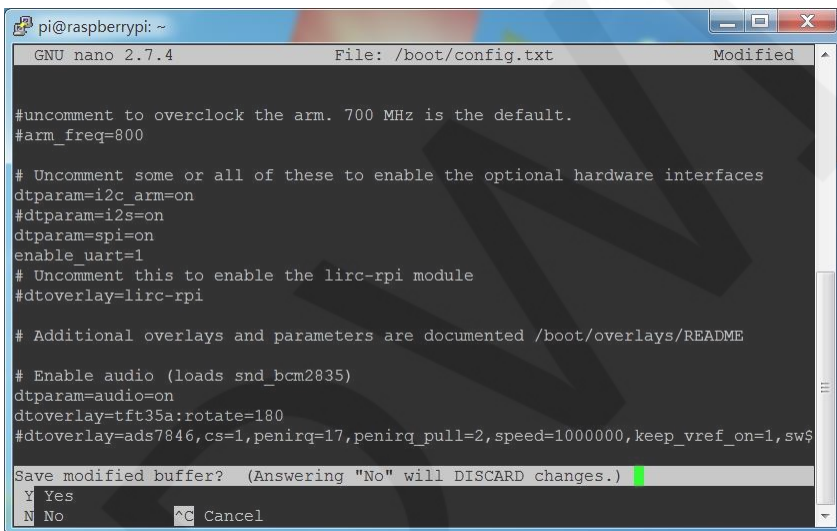
# Uncomment some or all of these to enable the optional hardware interfaces
dtparam=i2c_arm=on
#dtparam=i2s=on
dtparam=spi=on
enable_uart=1
# Uncomment this to enable the lirc-rpi module
#dtoverlay=lirc-rpi

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

# Enable audio (loads snd_bcm2835)
dtparam=audio=on
dtoverlay=tft35a:rotate=180
#dtoverlay=ads7846,cs=1,penirq=17,penirq_pull=2,speed=1000000,keep_vref_on=1,sw$

^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
```

Press **Y**, confirm to save;



```
pi@raspberrypi: ~
GNU nano 2.7.4 File: /boot/config.txt Modified
#uncomment to overclock the arm. 700 MHz is the default.
#arm_freq=800

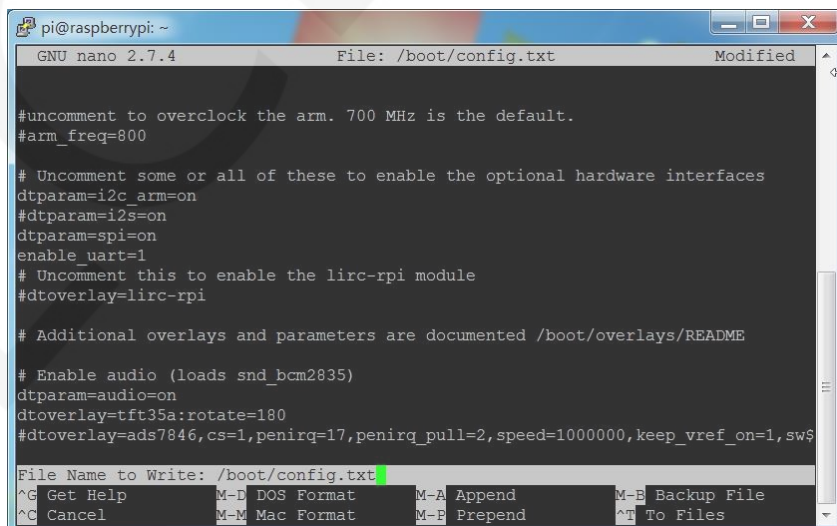
# Uncomment some or all of these to enable the optional hardware interfaces
dtparam=i2c_arm=on
#dtparam=i2s=on
dtparam=spi=on
enable_uart=1
# Uncomment this to enable the lirc-rpi module
#dtoverlay=lirc-rpi

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

# Enable audio (loads snd_bcm2835)
dtparam=audio=on
dtoverlay=tft35a:rotate=180
#dtoverlay=ads7846,cs=1,penirq=17,penirq_pull=2,speed=1000000,keep_vref_on=1,sw$

Save modified buffer? (Answering "No" will DISCARD changes.)
Y Yes
N No ^C Cancel
```

Press **Enter**, Make sure to save the file name



```
pi@raspberrypi: ~
GNU nano 2.7.4 File: /boot/config.txt Modified
#uncomment to overclock the arm. 700 MHz is the default.
#arm_freq=800

# Uncomment some or all of these to enable the optional hardware interfaces
dtparam=i2c_arm=on
#dtparam=i2s=on
dtparam=spi=on
enable_uart=1
# Uncomment this to enable the lirc-rpi module
#dtoverlay=lirc-rpi

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

# Enable audio (loads snd_bcm2835)
dtparam=audio=on
dtoverlay=tft35a:rotate=180
#dtoverlay=ads7846,cs=1,penirq=17,penirq_pull=2,speed=1000000,keep_vref_on=1,sw$

File Name to Write: /boot/config.txt
^G Get Help M-D DOS Format M-A Append M-B Backup File
^C Cancel M-M Mac Format M-P Prepend ^T To Files
```

### Restart Raspberry Pi

```
sudo reboot
```

## 2. Modify resistance touch parameters

When the display direction changes, the touch needs to be set by modifying the `99-calibration.conf` file.

### 1) Execute the command in the Raspberry Pi:

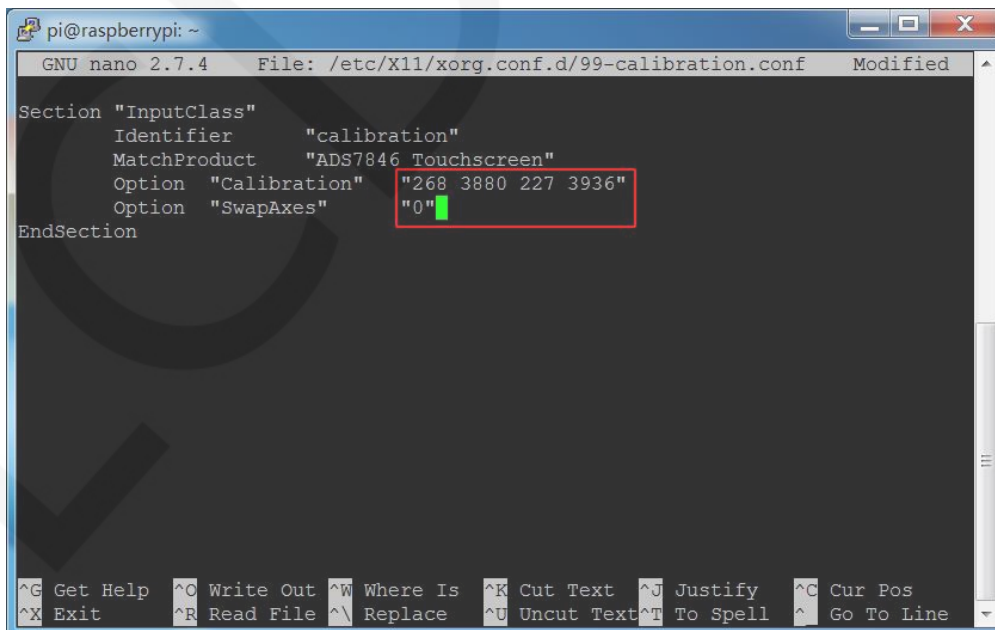
```
sudo nano /etc/X11/xorg.conf.d/99-calibration.conf
```

Take [3.5inch RPi Display \(MPI3501\)](#) as an example:

0 degrees of rotation, (`dtoverlay=tft35a:rotate=0`), the corresponding touch parameter is modified to:

```
Section "InputClass"
    Identifier      "calibration"
    MatchProduct   "ADS7846 Touchscreen"
    Option "Calibration" "268 3880 227 3936"
    Option "SwapAxes"   "0"
EndSection
```

As following picture shows:



```
pi@raspberrypi: ~
GNU nano 2.7.4 File: /etc/X11/xorg.conf.d/99-calibration.conf Modified
Section "InputClass"
Identifier      "calibration"
MatchProduct   "ADS7846 Touchscreen"
Option "Calibration" "268 3880 227 3936"
Option "SwapAxes"   "0"
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
```

2) After saving, restart the Raspberry Pi.

```
sudo reboot
```

(The following figure shows the relationship between rotation Angle and resistance touch parameters)

The relationship between rotation Angle and resistance touch parameters		
Angle \ Type	2.4, 2.8, 3.2-inch	3.5-inch (MPI3501)
rotate=0	"155 3865 115 3700" "0"	"268 3880 227 3936" "0"
rotate=90	"3700 115 155 3865" "1"	"3936 227 268 3880" "1" (Default Orientation)
rotate=180	"3865 155 3700 115" "0"	"3880 268 3936 227" "0"
rotate=270	"115 3700 3865 155" "1" (Default Orientation)	"227 3936 3880 268" "1"