

# RPi-Display

2.8" TFT-Display (240x320) with Touchpanel for Raspberry Pi.

## Linux Driver Installation

There is a [Linux Framebuffer driver \(FBTFT\)](#) available for the display (MI0283QT-9) and the ADS7846 touch controller has also a Linux device driver.

### [Install FBTFT](#) Framebuffer:

Install rpi-update for the kernel update:

```
$ sudo wget https://raw.githubusercontent.com/Hexxeh/rpi-update/master/rpi-update -O /usr/bin/rpi-update
$ sudo chmod +x /usr/bin/rpi-update
```

Remove or comment out the SPI blacklist line (spi-bcm2708):

```
$ sudo nano /etc/modprobe.d/raspi-blacklist.conf
```

Start kernel update:

```
$ sudo REPO_URI=https://github.com/notro/rpi-firmware rpi-update
$ sudo shutdown -r now
```

Install Touchscreen Tools:

```
$ sudo apt-get install xinput evtest
```

### [Activate Framebuffer:](#)

```
$ sudo modprobe fbtft_device name=mi0283qt-9a cs=0 gpios=reset:23,led:18 rotate=90
speed=16000000
```

To make it permanent (on Debian) add to the file `/etc/modules` the following line:

```
fbtft_device name=mi0283qt-9a cs=0 gpios=reset:23,led:18 rotate=90 speed=16000000
```

*Note: For a higher speed than 16MHz the display has to be connected directly to the Raspberry Pi or with wires not longer than 5cm.*

### [Activate Touchpanel:](#)

```
$ sudo modprobe ads7846_device model=7846 cs=1 gpio_pendown=25
speed=2000000 keep_vref_on=1 swap_xy=1 pressure_max=255 x_plate_ohms=60
x_min=250 x_max=3780 y_min=160 y_max=3930
```

To make it permanent (on Debian) add to the file `/etc/modules` the following line:

```
ads7846_device model=7846 cs=1 gpio_pendown=25 speed=2000000 keep_vref_on=1 swap_xy=1
pressure_max=255 x_plate_ohms=60 x_min=250 x_max=3780 y_min=160 y_max=3930
```

- Enable for Console:

```
$ con2fbmap 1 1
```

To make it permanent (on Debian) add to the file `/boot/cmdline.txt` at the end of the line the following kernel argument:

```
fbcon=map:10 fbcon=font:VGA8x8
```

- Enable for X-Window-System:

```
$ FRAMEBUFFER=/dev/fb1 startx &
```

*...wait till X-Window-System starts up...*

```
$ DISPLAY=:0 xinput --set-prop 'ADS7846 Touchscreen' 'Evdev Axis Inversion' 1 0
```

*...to stop X-Window-System run:*

```
$ sudo pkill x
```

To make it permanent (on Debian) see [autostart x](#) and [xinput axis inversion](#).

## Video Test:

```
$ sudo apt-get install mplayer
$ wget http://download.blender.org/peach/bigbuckbunny_movies/BigBuckBunny_320x180.mp4
$ mplayer -vo fbdev2:/dev/fb1 -vf scale=320:-3 BigBuckBunny_320x180.mp4
```

*Note: The video file is about 60MB big.*

## Display Connection

```
Display Raspberry Pi
```

```
-----
LCD-LED  GPIO18
LCD-RST  GPIO23
LCD-CS   GPIO8   (CE0)
ADS-CS   GPIO7   (CE1)
ADS-IRQ  GPIO25
MISO     GPIO9   (MISO)
MOSI     GPIO10  (MOSI)
SCK      GPIO11  (SCK)
```

## Optional Switch or LDR (Light-Dependent-Resistor)

There are pads for an optional tactile switch or LDR sensor on the PCB with a connection to **GPIO22** of the Raspberry Pi.

- Switch:
  - GPIO22 = 0 -> switch pressed
  - GPIO22 = 1 -> switch not pressed
- LDR (VT93N1):
  - GPIO22 = 0 -> bright light
  - GPIO22 = 1 -> low lig

### How to read the pin state?

```
$ sudo -i
$ echo 22 > /sys/class/gpio/export
$ echo in > /sys/class/gpio/gpio22/direction
$ exit
$ cat /sys/class/gpio/gpio22/value
```