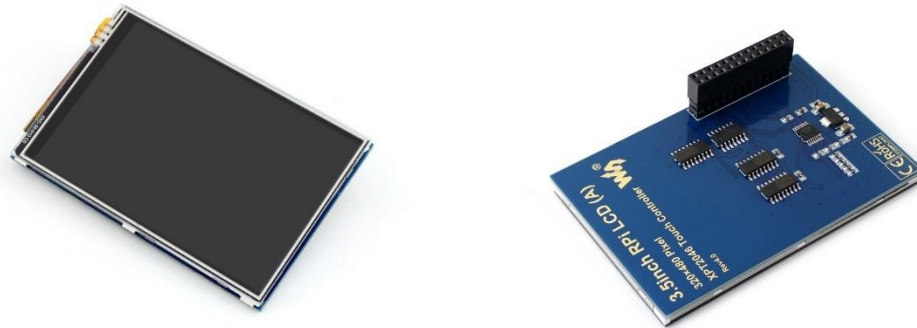# HDMI 3.5 Inch Display Waveshare (A)

The 3.5inch Resistive TFT Touch Screen Display, which uses SPI Protocol (serial peripheral interface) to communicate with the main processor. It can be mounted directly to the GPIO pins and it doesn't require any external power source. In here we have detailed explanation on how to install LCD drivers in a custom Raspbian image. The standard version of Raspbian does not include drivers for LCD touchscreens, so we will have to install and configure them manually.

FEATURES:

- 480x320 hardware resolution
- Resistive touch control
- Supports any revision of Raspberry Pi (directly- pluggable)
- Drivers provided (works with your own Raspbian/Ubuntu/Kali)
- Supports FBCP software driver as well, allows to config software resolution and set up dual-display
- Size perfectly fits the Pi (Raspberry Pi B+/2B/3B/3B+)
- High quality immersion gold surface plating
- Combined with the Raspberry Pi, allows you to:
- Take photos by touching (up to 17 camera modes)
- Use software keyboard (system interaction without keyboard/mouse)

SPECIFICATIONS:

Touch Type	Resistive
Backlight	LED
Interface Type	SPI
Driver IC	XPT2046
Pixel Resolution	320 x 480
Colors	65536
Aspect Ratio	8:5
Power Consumption	TBD
Backlight Current	TBD
Operating Temperature(⁰C)	TBD
LCD Type	TFT
Working temperature	0⁰C - 70⁰C

PIN DESCRIPTION:

PIN NO.	SYMBOL	DESCRIPTION
1,17	3.3V	Power positive (3.3V power input)
2,4	5V	Power positive (5V power input
3,5,7,8,10,11,12,13,15,16	NC	NC
6,9,14,20,25	GND	Ground
11	TP_IRQ	Touch panel interrupt, low level while the Touch panel detects touching
18	LCD_RS	Instruction/Data Register selection
19	LCD_SI/TP_SI	SPI data input of LCD/Touch panel
21	TP_SO	SPI data input of Touch panel
22	RST	Reset
23	LCD_SCK/TP_SCK	SPI clock of LCD/Touch panel
24	LCD_CS	LCD chip selection, low active
26	TP_CS	Touch panel chip selection, low active

HOW TO USE:

The RPi LCD can be driven in two ways: Method 1. install driver to your Raspbian OS. Method 2. use the Ready-to-use image file of which LCD driver was pre-installed.

HARDWARE CONNECTION:

Take 3.5 inch RPi LCD (A) as example, need to insert the RPi LCD to 40Pin header of Raspberry Pi.

Method 1: Driver Installing

- Download OS image file from Raspberry Pi Website (Raspbian/Ubuntu Mate/Kali/Retropie)
- Download image and extract to get .img file
  The instruction is based on Raspbian OS.
- Insert SD card to your PC, format it and write .img file to SD card by Win32 Disk Imager software.
- Insert SD card to your Raspberry Pi and power on. Access Raspberry Pi via SSH or you can connect HDMI screen and keyboard to it directly. Open Terminal
- Download driver, don't forget connect network

Git clone https://github.com/waveshare/LCD-show.git cd LCD-show/

- For 3.5 inch RPI LCD (A)

```
Sudo ./LCD35-show
#or (for Raspbian-stretch-Lite)
Sudo ./LCD35-show lite
```

- Waiting for rebooting

Method 2: User Ready – To – Use Image

- Download the Ready – To – Use Image which has driver pre-installed
- 3.5 inch RPi LCD (A)
- Use Win32DiskImage to write the image to SD Card
- Insert SD card to Raspberri Pi and power on

SETTING ORIENTATION:

After installing driver, it can change screen's orientation by executing commands as below:

```
Cd LCD-show/
```

For 3.5 inch RPi LCD (A)

```
Sudo./LCD35-show X
#X should be 0,90,180 or 270
```

CALIBRATION:

If the touch of RPi LCD is not calibrated, it can calibrate the touch screen.

- Copy and install calibrator tool

```
Cp LCD-show/xinput-calibrator_0.7.5-1armhf.deb~/

Sudo dpkg-i-B xinput-calibrator_0.7.5-1_armhf.deb
```

- Install X service

```
Sudo apt-get install xserver-xorg-input-evdev

Sudo cp-rf/usr/share/X11/xorg.conf.d/10-evdev/usr/share/X11/xorg.conf.d/45-evdev.conf

Sudo reboot
```

- Running calibrator and finish calibrator

```
DISPLAY=:0.0xinput_calibrator
```

- Saving the calibration data to 99-calibration.conf.file

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

Sudo nano /etc/X11/xorg.conf.d./99-calibration.cof
```
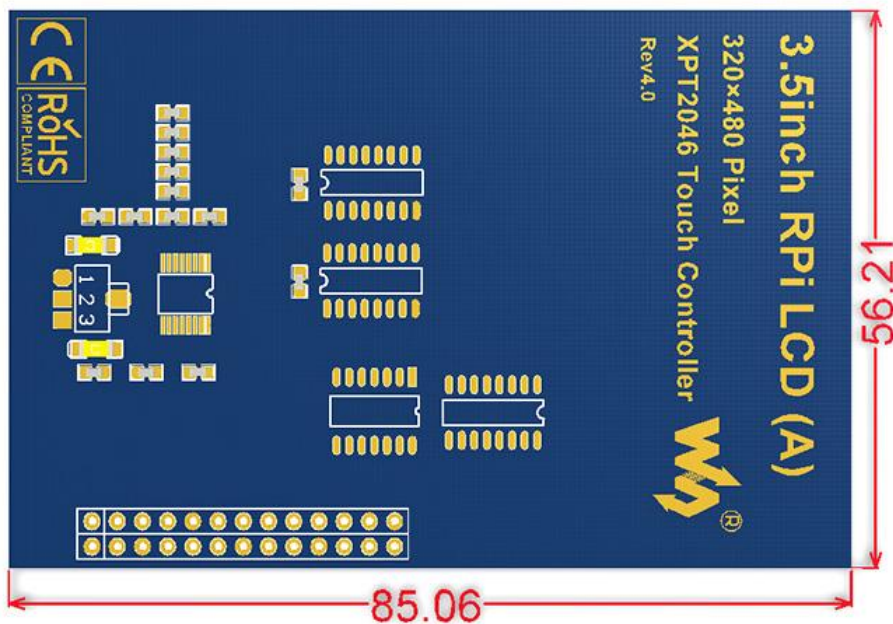
The calibration data looks like:

```
Section "InputClass"
        Identifier      "calibration"
        MatchProduct    "ADS7846 Touchscreen"
        Option  "Calibration"   "208 3905 288 3910"
        Option  "SwapAxes"      "0"
EndSection
```

PACKAGE INCLUDES:

- 3.5 inch RPI LCD (A) x 1

- Touch pen x 1

- RPI screws pack (2 pcs) x 1

- Quick start sheet x 1

OUTER DIMENSION:

APPLICATIONS:

- Blu-ray Disc and HD DVD players

- Digital cameras and camcorders

- Gaming consoles

- Tablet computers

- Mobile phones