

HDMI 3.5 INCH Display Waveshare



The 3.5 inch 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, software configurable up to 1920x1080
- Resistive touch control
- IPS technology, high quality and perfect displaying from very wide viewing angle
- Compatible and Direct-connect with any revision of Raspberry Pi (except the Pi 1 model B or Pi Zero, which requires an HDMI cable)
- Drivers provided (works with your own Raspbian/Ubuntu/Kali/Retropie)
- Supports FBCP software driver as well, allows to config software resolution and set up dual-display
- Also works as a computer monitor, in this case, touch panel is unavailable and HDMI cable is required
- HDMI interface for displaying, no I/Os required (however, the touch panel still needs I/Os)
- Multi-languages OSD menu, for power management, brightness adjustment, contrast adjustment, etc.
- Supports 100-level backlight adjustment
- Supports HDMI audio output

SPECIFICATIONS:

Touch Type	Resistive
Backlight	LED
Interface Type	SPI
Driver IC	XPT2046
Pixel Resolution	480x320
Colors	65536
Aspect Ratio	8:5
Power Consumption	TBD
Backlight Current	TBD
Operating Temperature(°C)	TBD
LCD Type	TFT
Working Temperature	0°C - 70°C
Display Port	HDMI
Display Panel	IPS
View Angle	160°

PIN DESCRIPTION:

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

HOW TO USE:

The touch of the LCD can be driven in two ways:

Method 1: Install driver manually

Method 2: Using ready-to-use Image

HARDWARE CONNECTION

- Insert LCD directly to 40PIN header of Raspberry Pi.
- Using the HDMI adapter or HDMI cable to connect HDMI interface of LCD to Raspberry Pi's

Method 1: Install Driver

- Download latest OS' image from Raspberry Pi website
- Extract image from ZIP archive and write it to SD card
- After writing, modify the config.txt file which is located at root directory (BOOT) of SD card. Append these statements to the end of config.txt file
- This instruction is based on Raspberry OS

```
Max_usb_current=1  
  
Hdmi_group=2  
  
Hdmi_mode=87  
  
Hdmi_cvt 800 480 60 6 0 0 0  
  
Hdmi_drive=2
```

- Insert SD card to Raspberry Pi and power it on
- Connect to network, open terminal to download and install driver.

```
git clone https://github.com/waveshare/LCD-show.git  
cd LCD-show/  
sudo ./LCD35-HDMI-480x320-show
```

- Waiting for rebooting

Method 2: Using Ready-To-Use Image

- Download image -Raspbian for 3.5 inch HDMI LCD
- Extract the image file and write to SD Card
- Insert the SD Card to Raspberry Pi and power on

SOFTWARE CONFIGURING RESOLUTION

- The hardware resolution of 3.5inch HDMI LCD, it can also support software configuring resolution. As we test in Raspbian with Raspberry Pi, the LCD supports 480×320 800×480 800×600 1024×768 1152×864 1280×720 1280×768 1280×800 1280×960 1280×1024 1360×768 1366×768 1440×900 1600×900 1600×1024 1680×1050.
- To configure the resolution, you can modify the config.txt

```
# Enable audio (loads snd_bcm2835)
dtparam=audio=on
hdmi_group=2
hdmi_mode=1
hdmi_mode=87
hdmi_cvt 480 320 60 6 0 0 0
dtoverlay=ads7846,cs=1,penirq=25,penirq_pull=2,speed=50000,keep_vref_on=
0,swapxy=0,pmax=255,xohms=150,xmin=200,xmax=3900,ymin=200,ymax=3900
hdmi_drive=1
```

- Change the parameters of hdmi_cvt, for example, change to 800x480

```
# Enable audio (loads snd_bcm2835)
dtparam=audio=on
hdmi_group=2
hdmi_mode=1
hdmi_mode=87
hdmi_cvt 800 480 60 6 0 0 0
dtoverlay=ads7846,cs=1,penirq=25,penirq_pull=2,speed=50000,keep_vref_on=
0,swapxy=0,pmax=255,xohms=150,xmin=200,xmax=3900,ymin=200,ymax=3900
```

- Save and reboot.

Note: Because the LCD is only 3.5inch, we recommend you to use 480x320 or 800x480 resolution setting.

SETTING RESOLUTION

After installing driver, you can set the orientation as below

```
cd LCD-show/  
sudo ./LCD35-HDMI-480x320-show X
```

(Note) X can be 0, 90, 180 or 270

CALIBRATION

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

- Copy and install calibrator tool

```
Cp LCD-show/xinput-calibrator_0.7.5-1_armhf.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.conf /usr/share/X11/xorg.conf.d/45-evdev.conf  
sudo reboot
```

- Running calibrator and finish calibration

```
DISPLAY=:0.0 xinput_calibrator
```

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

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

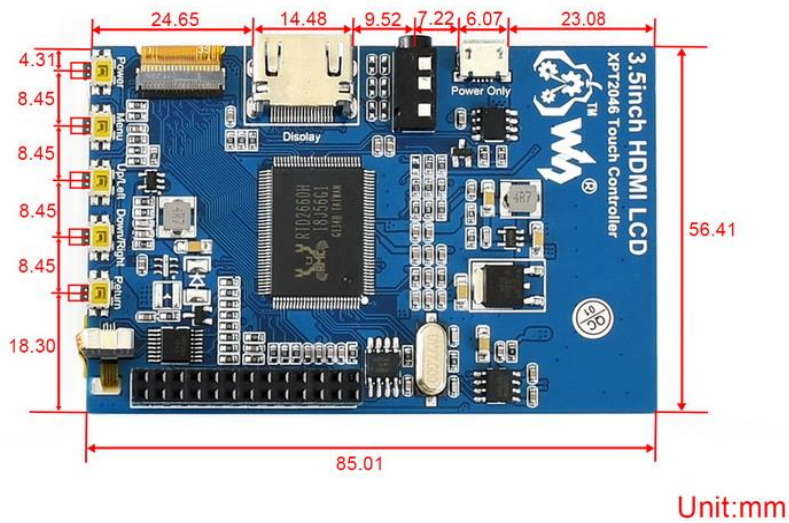
The calibration data looks like;

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

PACKAGE INCLUDES:

- 3.5 inch HDMI LCD x 1
- HDMI connector x 1
- HDMI to micro HDMI connector x 1
- Touch pen x 1
- Aluminium heat sink 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