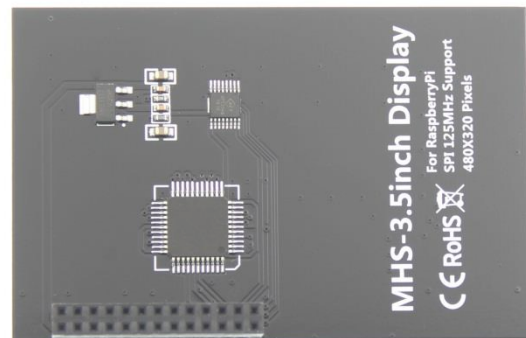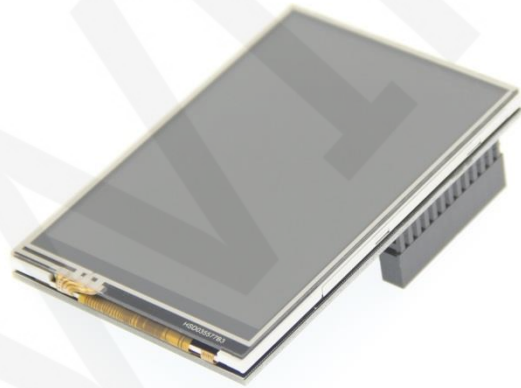# MHS-3.5inch Display User Manual

Product Features

- Physical resolution 320×480 with resistive touch control

- Support 125MHz SPI signal input, display stable no-screen without flicker

- With the Raspberry Pi, the refresh rate is about 60FPS, playing video games is no problem.

- Support FBCP software driver, support dual screen display, can be adjusted by software to adjust the resolution

- Same size as the Raspberry Pi, perfectly compatible and can be directly inserted into any version of the Raspberry Pi (Raspberry Pi ZeroW, A, A+, B, B+, 2B, 3B, 3B+)

- Support for Raspbian/Ubuntu/Kali/Retropie systems, providing drivers and mirroring

- This product has passed CE and RoHS certification.

Product Parameters

Name	Description
Display Color	RGB 65K color
SKU	MHS3528
Screen Size	3.5(inch)
Type	TFT
Driver IC	ILI9486
Background light	LED
Resolution	320*480 (Pixel)
Module Interface	SPI (supports 125MHz SPI signal input)
Touch panel type	Resistive type
Touch panel control chip	XPT2046
Operating Temperature	-20℃~70℃
Storage Temperature	-40℃~70℃
Operating Voltage	3.3V / 5V

Power Consumption	0.16A*5V
Module PCB Size	85.42*55.60(mm)

Interface Description

The pin numbers are as shown below:
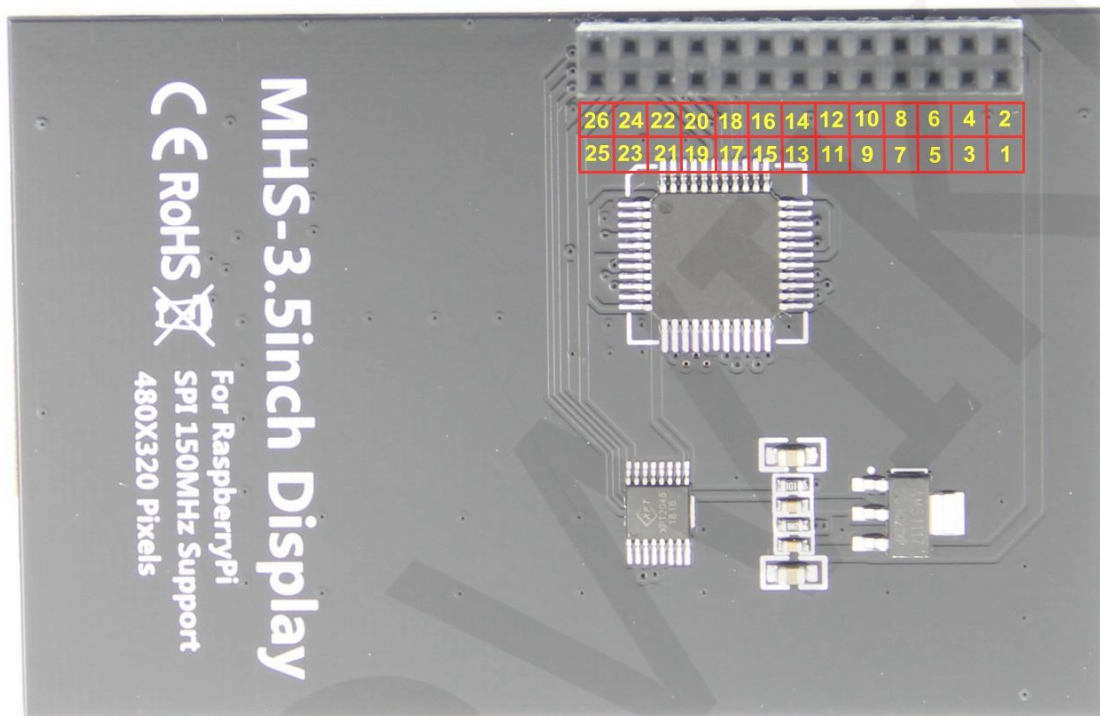
Number	Module Pin	Pin Description
1 \ 17	3.3V	Power supply (3.3V power input)
2 \ 4	5V	Power supply (5V power input)
3 \ 5 \ 7 \ 8 \ 10 \ 12 \ 13 \ 15 \ 16	NC	Not connected
6 \ 9 \ 14 \ 20 \ 25	GND	Power ground
11	TP_IRQ	The touch panel is interrupted, and it is detected that the touch panel is pressed low.
18	LCD_RS	Instruction/data register selection

19	LCD_SI/TP/SI	LCD display / touch panel SPI data input
21	TP_SO	Touch panel SPI data output
22	LCD_RST	Reset signal
23	LCD_SCK/TP_SCK	LCD display / touch panel SPI clock signal
24	LCD_CS	LCD chip select signal, low level enable
26	TP_CS	Touch panel chip select signal, low level enable

Hardware Configuration

The LCD module adopts the in-line design, and can be directly inserted into the GPIO port of the RaspberryPi development board according to the wiring requirements, and does not need to be deliberately wired. The module also contains two modules: touch control circuit and LCD display control circuit.

The touch control circuit is responsible for controlling touch events, including powering the touch control IC, acquiring touch breaks, acquiring ADC values of touch locations, and touch calibration.

The LCD display circuit is responsible for LCD display control, including GPIO control of the LCD screen, display of color value reading and writing, and register configuration.

Instructions for use

The First Method

1. directly download the system image file we provided, burn it into the micro SD, and then put it on the RaspberryPi. For the specific burning method, see the following file:

   http://www.lcdwiki.com/res/PublicFile/How_to_use_Raspberry_Pi(Download,Format,Burn,SSH,PuTTy)-V1.0.pdf

   The image file download can be downloaded from the resource download section of the following URL.

http://www.lcdwiki.com/MHS-3.5inch_RPi_Display

The Second Method

1. download the latest official system image file

   The official website of each system is as follows:

   Raspbian：https://www.raspberrypi.org/downloads/

   Ubuntu：https://ubuntu-mate.org/raspberry-pi/

   Kali-linux：https://www.offensive-security.com/kali-linux-arm-images/

   RetroPie：https://retropie.org.uk/download/

2. make a system image file

   The specific production methods are as follows:

   http://www.lcdwiki.com/res/PublicFile/How_to_use_Raspberry_Pi(Download,Format,Burn,SSH,PuTTy)-V1.0.pdf

3. connect to RaspberryPi

   Insert the LCD screen holder to the right to insert the Raspberry Pi pin.

   Insert the MicroSD card that burns the official system image file, connect the

   network cable, and connect the power supply.

4. install LCD driver

   A. Install on the Raspbian system (the Raspberry Pi needs to connect to the

      Internet)

      1) Open the putty connection ssh, enter the username and password to log in to

         the Raspberry Pi terminal (the default username and password are shown in

         the table below).

System	Default username	default password

Raspbian	pi	raspberry
Ubuntu-mate	pi	raspberry
Kali-linux	root	toor
RetroPie	pi	raspberry

The specific login party see the following file to add the SSH file and use the

putty to connect to the RaspberryPi description section:

http://www.lcdwiki.com/res/PublicFile/How_to_use_Raspberry_Pi(Download,Format,

Burn,SSH,PuTTy)-V1.0.pdf

2) After the login is successful, execute the following command (you need to

connect the RaspberryPi to the Internet):

```
sudo rm -rf LCD-show
git clone https://github.com/goodtft/LCD-show.git
chmod -R 755 LCD-show
cd LCD-show/
sudo ./MHS35-show
```

B. Install on the Ubuntu Mate, Kali, Retropie system

1) Download the local driver(Because of system differences, the driver

downloaded from github cannot run normally in the three systems Ubuntu

Mate, Kali, Retropie, so only local drivers can be used)

The local driver download can be found in the LCD driver section of Method 2

used in the Raspberry/Rbbian/Ubuntu Mate/Kali/Retropie system on the

following page.

http://www.lcdwiki.com/MHS-3.5inch_RPi_Display

2) Open the putty connection ssh, enter the username and password to log in to

the Raspberry Pi terminal (the default username and password are shown in

the table below).

System	Default username	default password
Raspbian	pi	raspberry
Ubuntu-mate	pi	raspberry
Kali-linux	root	toor

RetroPie	pi	raspberry

The specific login party see the following file to add the SSH file and use the putty to connect to the RaspberryPi description section:

http://www.lcdwiki.com/res/PublicFile/How_to_use_Raspberry_Pi(Download,Format, Burn,SSH,PuTTy)-V1.0.pdf

3) Copy the local driver to the running Raspberry Pi system and execute the following command to extract it (can be copied by SD card or FileZilla software)

```
tar –xvzf LCD-show.tar.gz
```

4) Execute the following command to install the LCD driver

```
chmod -R 755 LCD-show
cd LCD-show/
sudo ./MHS35-show
```

5. Check if the driver is successfully installed

After the LCD driver is installed, the system will automatically restart. After the startup is successful, the LCD can display and touch normally,indicating that the driver installation is successful.

Note:

1) The setting method of ubuntu system login through SSH is as follows:

http://www.lcdwiki.com/res/PublicFile/RaspberryPi_Ubuntu-mate_Open_SSH_Instructions_EN.pdf

2) The solution to the ubsh connection failure of ubuntu-18.04 system is as follows:

http://www.lcdwiki.com/res/PublicFile/RaspberryPi_Ubuntu-mate-18.04_SSH_Connect_EN.pdf

3) The retropiie-rpi1_zero system cannot log in via SSH (no network port and wifi module), you need to copy the driver through the serial port. The specific setting method is as follows:

http://www.lcdwiki.com/res/PublicFile/RaspberryPi_Zero_Open_Serial_Instructions_EN.pdf

Using the system

A. Switch back to HDMI display

Switch to the HDMI display by entering the following command:

```
sudo ./LCD-hdmi
```

B. calibration resistance touch screen

The specific calibration method is as follows:

http://www.lcdwiki.com/res/PublicFile/How_to_calibrate_the_resistance_touch_screen-V1.2.pdf

C. modify the display direction and GPIO resistance touch screen parameters

The specific calibration method is as follows:

http://www.lcdwiki.com/res/PublicFile/How_to_change_display_direction-GPIO-Resistive_Touch-V1.2.pdf

D. how to use the Retropie system

Retropie is a game system. For instructions on how to install games and play

games, see the following documents:

http://www.lcdwiki.com/res/PublicFile/RaspberryPi_Retropie_Using_Instructions_EN.pdf

Scan the QR Code

For more details