

# 1.54-inch e-ink display

## Hardware

The [XC3747](#) e-ink display module is nice 200x200 display using [e-ink technology](#). The board is controlled via cable connector and using an SPI protocol. Advantages of e-ink over traditional LED, LCD and OLED displays are low power consumption, wide viewing angle, reflective viewing and persistent displays without power, making this suitable for long-lasting, outdoor applications where visibility is the main concern.

*Note: while this module is compatible with arduino and uno based code, it is recommended to use devices with higher ram, such as the [XC3812](#) SAMD21 board, ESP family of boards, or the raspberry pi. Currently, the arduino does not have enough RAM to draw, so this functionality has been removed from the arduino library.*

### Specifications

Outline dimension	48mm x 33mm
Display size	27.6mm x 27.6mm
Dot pitch	0.138 x 0.138
Resolution	200 x 200
Display Color	Red, black, white
Grey Level	2
Full refresh time	8 seconds
Refresh power	26.4 mW (typical)
Standby power	< 0.017 mW
Viewing Angle	>170°

## Pinout Connections

XC3742	UNO	RPI	Description (!) indicates low.
VCC	5V	3.3V	Power
GND	GND	GND	Ground
DIN	D 11	MOSI	Data in ( SPI MOSI )
CLK	D 13	SCLK	Clock (SPI CLK)
CS	D 10	CE0	Chip Select ( SPI CS)
DC	D 9	25 (BCM)	Data/ (!)Command Control
RST	D 8	17 (BCM)	(!) External Reset
BUSY	D 7	24 (BCM)	(!) Busy state output.

- Remember with the Raspberry Pi, you must use `sudo raspi-config` to enable the SPI interface.

## Repository

You can download complete example code from the following location, or on our website:

<https://github.com/waveshare/e-Paper.git>

Australia

[www.jaycar.com.au](http://www.jaycar.com.au)

[techstore@jaycar.com.au](mailto:techstore@jaycar.com.au)

1800 022 888

New Zealand

[www.jaycar.co.nz](http://www.jaycar.co.nz)

[techstore@jaycar.co.nz](mailto:techstore@jaycar.co.nz)

0800 452 922

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## Arduino Code

After you have downloaded the code from above, look in the Arduino directory for **epd1in54b** – this is the code that corresponds to this display. Load the .ino file into your arduino ide and press upload.

This code uses binary images in the source code. You can do similar by using software such as gimp to save 200x200 sized images as c-styled headers.

## Raspberry Pi

It is possible that you need to install BCM2835 development libraries, along with some more python libraries, depending on your installation.

```
wget http://www.airspayce.com/mikem/bcm2835/bcm2835-1.60.tar.gz
tar zxvf bcm2835-1.60.tar.gz
cd bcm2835-1.60/
sudo ./configure
sudo make
sudo make check
sudo make install

#For more details, please refer to http://www.airspayce.com/mikem/bcm2835/
```

For python libraries:

```
sudo apt-get install wiringpi
#For Pi 4, you need to update it :
cd /tmp
wget https://project-downloads.drogon.net/wiringpi-latest.deb
sudo dpkg -i wiringpi-latest.deb
gpio -v
#2.52 or higher
sudo apt-get update
sudo apt-get install python3-pip
sudo apt-get install python3-pil
sudo apt-get install python3-numpy
sudo pip3 install RPi.GPIO
sudo pip3 install spidev
```

Then run the C / python code as normal, in the **epd1in54b** folder.

Australia  
www.jaycar.com.au  
[techstore@jaycar.com.au](mailto:techstore@jaycar.com.au)  
1800 022 888

New Zealand  
www.jaycar.co.nz  
[techstore@jaycar.co.nz](mailto:techstore@jaycar.co.nz)  
0800 452 922

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