

Embedded Artists 2.7 inch E-paper Display Module & Raspberry Pi



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1 Required Hardware

The hardware listed below is needed to get Embedded Artists 2.7 inch E-paper display module connected to a Raspberry Pi board.

- **Raspberry Pi** board (512 MB Model B was used for these instructions)
 - See chapter 2 for additional requirements to get a Raspberry Pi board up-and-running.
- Embedded Artists 2.7 inch **E-paper Display** module. Part number: EA-LCD-009
http://www.embeddedartists.com/products/displays/lcd_27_epaper.php
- 13 pcs female-to-female **jumper wires** (prototyping cables). Embedded Artists 50 pack with part number EA-ACC-015 can be used.
http://www.embeddedartists.com/products/acc/acc_wire_ff.php

2 Setup Raspberry Pi

Follow the instructions in the Raspberry Pi Quick start guide to get a Raspberry Pi board up-and-running. The PDF version of the guide lists the needed hardware and also contains all instructions for preparing an SD card with Raspberry Pi's operating system. The Raspbian Wheezy (2013-02-09) was used when writing these instructions.

When you have Raspberry Pi up-and-running you need Internet access and you need to perform the instructions in the remaining part of this document from a console (terminal). There are several alternatives for terminal access:

- Don't start the window manager (don't call startx)
- From within the window manager start LX Terminal
- Use an SSH connection to the board. SSH can be enabled at the configuration step (raspi-config) when setting up the Raspberry Pi.

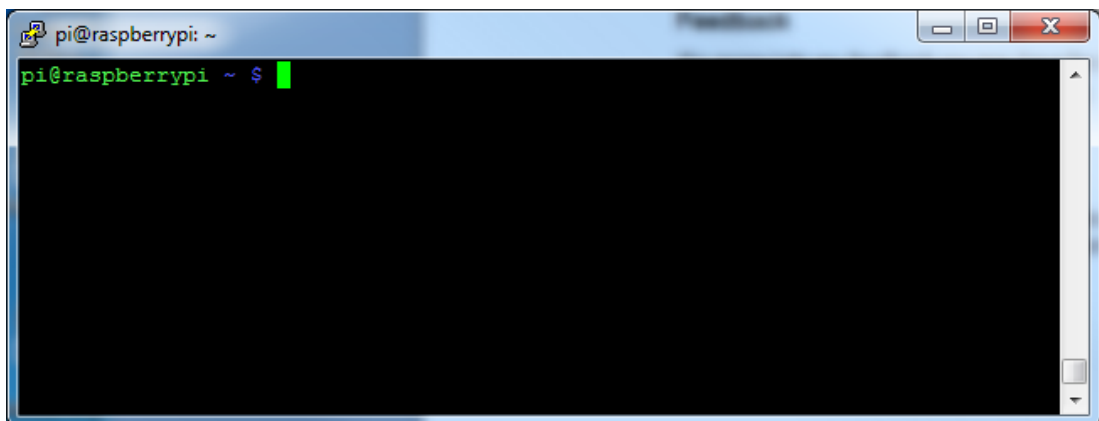


Figure 1 - SSH connection giving terminal access

2.1 Links

<http://www.raspberrypi.org/quick-start-guide>

The links below are direct links to the documents and files used when porting the E-paper demo to the Raspberry Pi. If these links doesn't work please use the link above to find the latest versions of the files.

PDF Quick Start Guide

<http://www.raspberrypi.org/wp-content/uploads/2012/12/quick-start-guide-v1.1.pdf>

Raspbian Wheezy

<http://downloads.raspberrypi.org/images/raspbian/2013-02-09-wheezy-raspbian/2013-02-09-wheezy-raspbian.zip>

Win32 Disk Imager (if you use Windows)

<http://sourceforge.net/projects/win32diskimager/>

3 Install WiringPi

WiringPi is an Arduino wiring-like C library developed by Gordon Henderson. This library makes it easy to use the GPIO pins, SPI, and I2C interfaces on the Raspberry Pi.

There is an excellent guide on Gordon's project site of how to install WiringPi. The exact steps used when writing these instructions are listed below.

<https://projects.drogon.net/raspberry-pi/wiringpi/download-and-install/>

1. Update package index

```
$ sudo apt-get update
```

2. Install GIT (WiringPi is maintained under the version control system called GIT)

```
$ sudo apt-get install git-core
```

3. Download the code to home directory

```
$ cd  
$ git clone git://git.drogon.net/wiringPi
```

4. The I2C interface is needed and an additional package must be installed for this to work

```
$ sudo apt-get install libi2c-dev
```

5. Build and install

```
$ cd wiringPi  
$ ./build
```

4 Connect the Display

Use female-to-female jumper wires (prototyping cables) to connect the Raspberry Pi with the display. The figures below as well as the table guides you how to connect the cables.

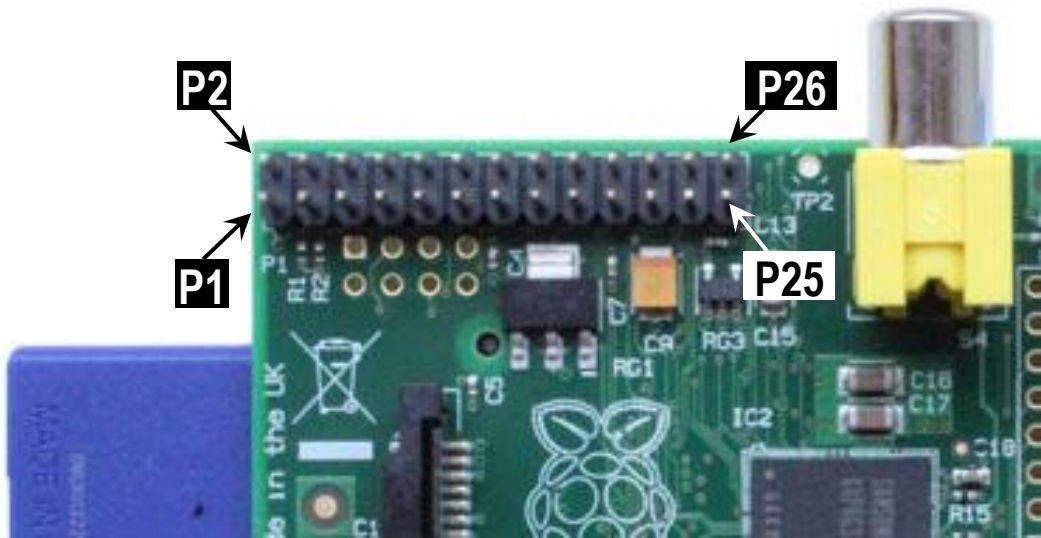


Figure 2 - Pin numbering on Raspberry Pi

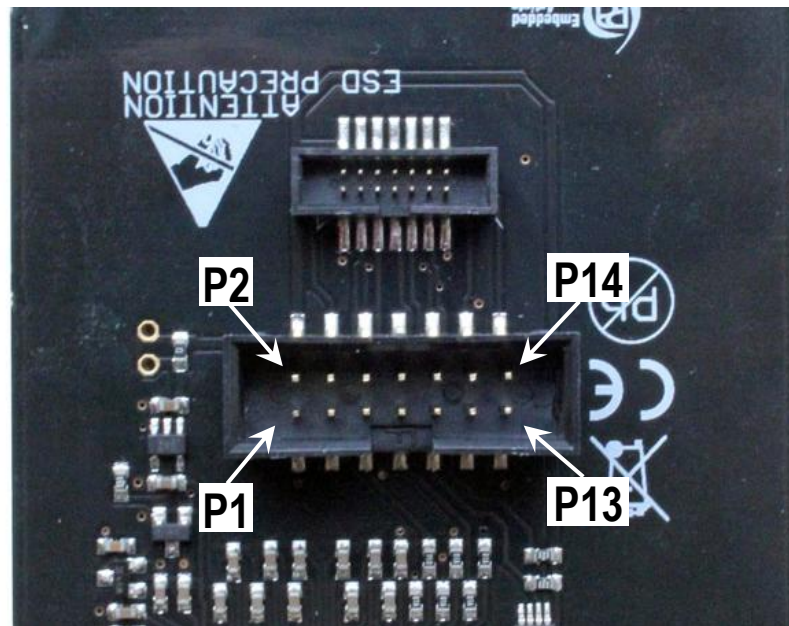


Figure 3 - Pin numbering on display

Raspberry Pi			Display	
3	SDA	↔	10	SDA
5	SCL	↔	9	SCL
11	GPIO0 (17)	↔	7	Busy
12	GPIO1 (18)	↔	11	PWM
15	GPIO3 (22)	↔	13	Power control
16	GPIO4 (23)	↔	14	Discharge

17	3V3	↔	2	3V3
18	GPIO5 (24)	↔	12	Reset
19	MOSI	↔	4	MOSI
21	MISO	↔	5	MISO
22	GPIO6 (25)	↔	6	SSEL
23	SCK	↔	3	SCK
25	GND	↔	1	GND

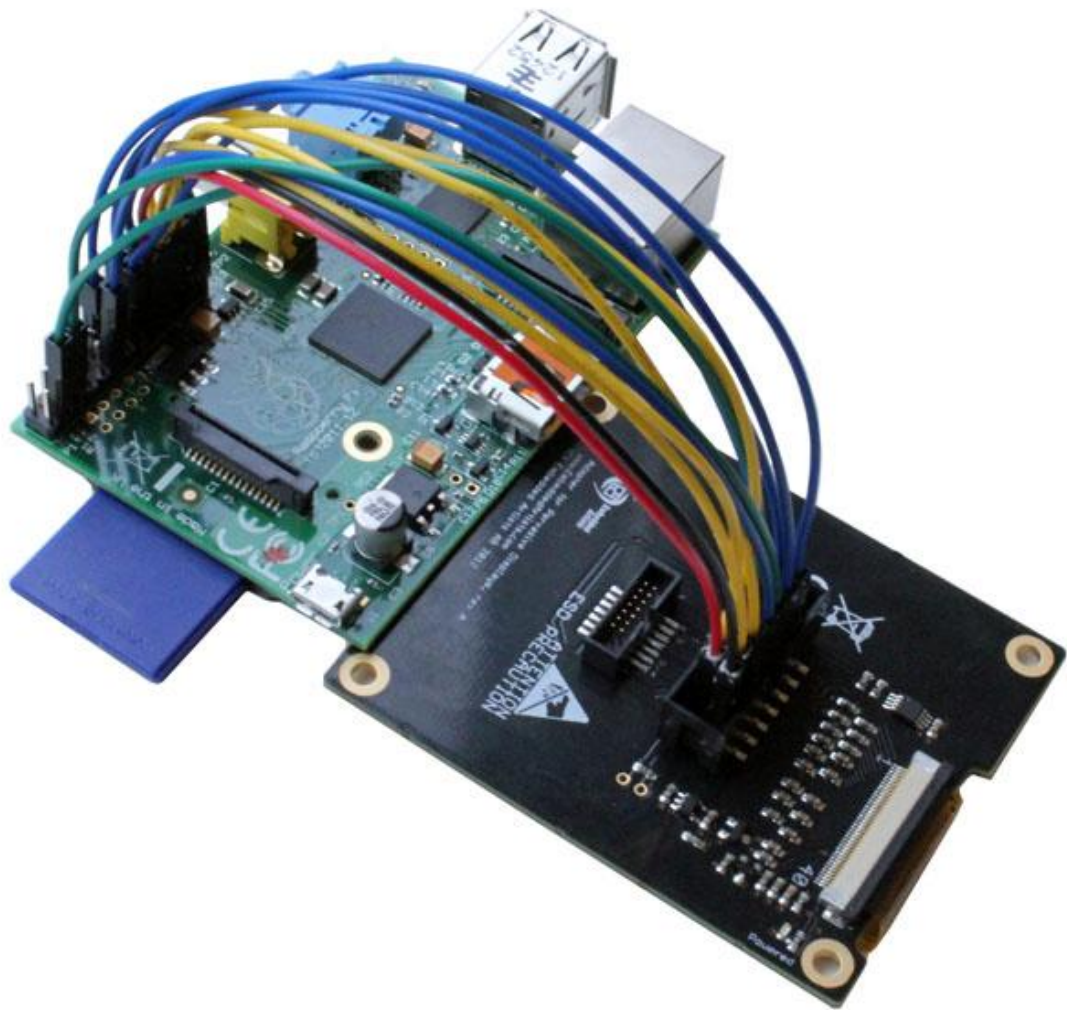


Figure 4 - Raspberry Pi connected to Display

5 Download and Build the Demo Code

1. Download the demo code to home directory
http://www.embeddedartists.com/sites/default/files/support/displays/epaper/epaper_pi_130307.tar.gz

```
$ cd
$ wget
http://www.embeddedartists.com/sites/default/files/support/displays/epaper/epaper\_pi\_130307.tar.gz
```

2. Unpack the package

```
$ tar -xzvf epaper_pi_130307.tar.gz
```

3. Build the demo

```
$ cd epaper
$ make
```

6 Run the Demo

The demo will output two different images to the display. The switch between the images is done each 10 seconds.

1. Load SPI driver (only needed to be done once)

```
$ gpio load spi
```

2. Load I2C driver (only needed to be done once)

```
$ gpio load i2c
```

3. Run the demo (must be run as root)

```
$ sudo ./epaper
```

7 Disclaimer

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