

How to use Waveshare E-Paper Display with Raspberry Pi

What is a Waveshare E-Paper Display?

A Waveshare E-Paper Display is an electronic ink (e-ink) screen designed for low-power, high-visibility applications. These displays mimic the appearance of traditional ink on paper, making them ideal for projects requiring clear readability without constant power consumption. In short, it's the Kindle's screen.

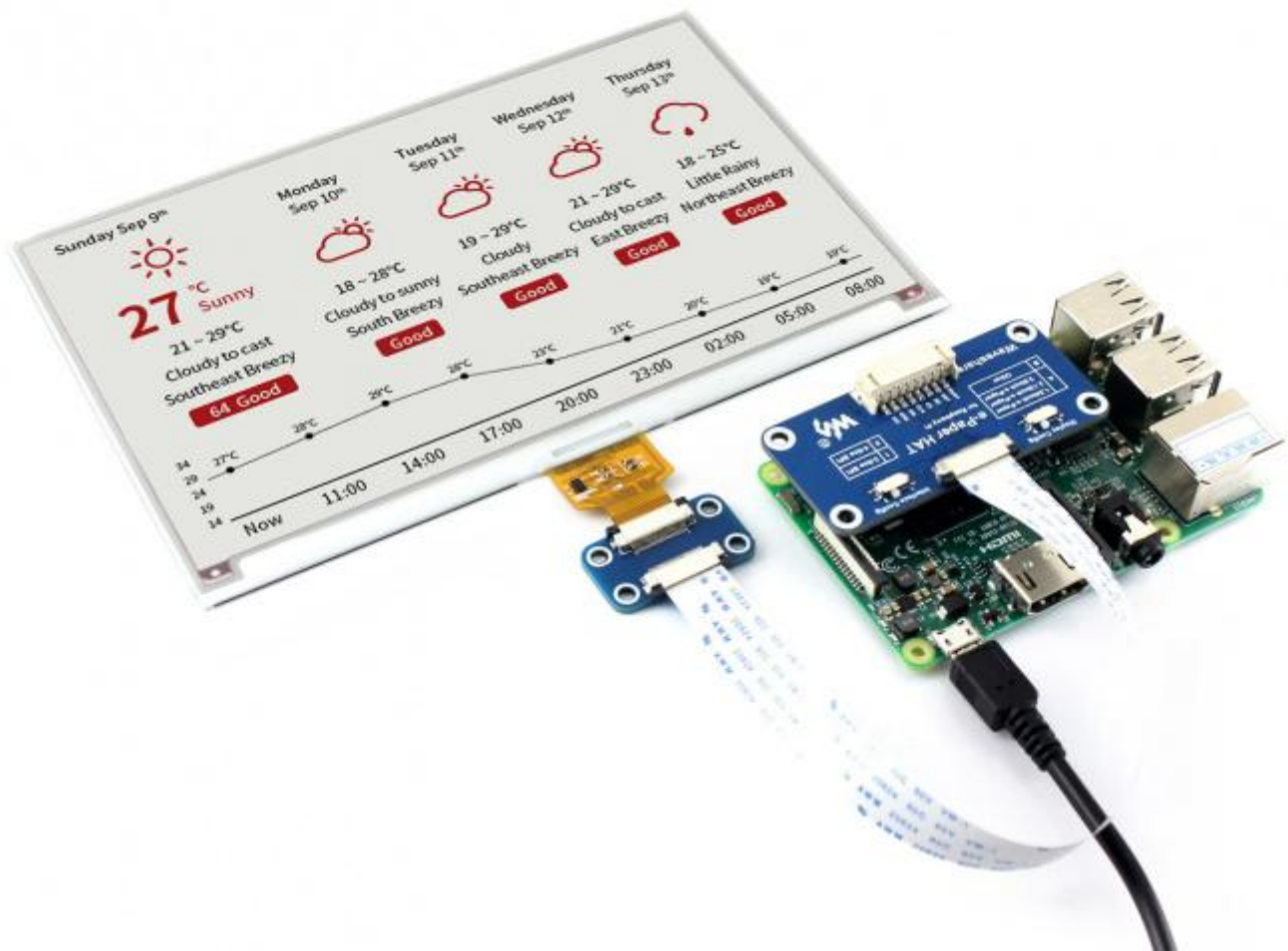
In this tutorial, we will be using the Waveshare model **epd7in5V2**, a **Raspberry Pi 3** and **Python** as the programming language. The display is also compatible with Arduino, C and Jetson Nano. For more information or tutorials, please visit the official [guide](#).

Connection

Disconnection from Power

Disconnect the power supply to the Raspberry Pi before you proceed with any connection.

The display comes with an e-paper Driver HAT, so simply plug in.



You may need to insert the ribbon cable (the golden one) from the display to the HAT.

1. Gently pull up the black clip (green arrow)
2. Insert the golden cable (red arrow, pay attention to the direction)
3. Press down the black clip to secure it.



Setting Up the Pi

Enable SPI in pi

1. Input this command `sudo raspi-config` in the Terminal.
2. Navigate to **Interface Options** → **SPI** → **Enable**
3. Reboot the pi by `sudo reboot`

Install Python Library

```
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
```

Download Python Example code from Github

```
git clone https://github.com/waveshare/e-Paper.git
```

Go to the Directory (folder) where the example codes are located

```
cd e-Paper/RaspberryPi_JetsonNano/python/examples/
```

Run the Python Code

You can either run the code from the Terminal or use a Python-based software such as Visual Studio or Thonny. In Terminal:

```
python3 epd_7in5_V2_test.py
```

The display should now be blinking and have some demos displayed.

Something more

The below code is to draw a rectangle with random size and location on the display.

```
#!/usr/bin/python
# -*- coding:utf-8 -*-

import sys
import os

libdir = os.path.join(os.path.dirname(os.path.dirname(os.path.realpath(__file__))), 'lib')
if os.path.exists(libdir):
    sys.path.append(libdir)

import logging
import random
from waveshare_epd import epd7in5_V2
import time
from PIL import Image, ImageDraw, ImageFont
import traceback

logging.basicConfig(level=logging.DEBUG)

try:
    logging.info("epd7in5_V2 Demo")
    epd = epd7in5_V2.EPD()
```

```

logging.info("init and Clear")
epd.init_fast()
epd.Clear()

# print(f"Display Width: {epd.width}, Display height: {epd.height}")
# Display Width: 800, Display height: 480
# Create a blank image
Himage = Image.new('1', (epd.width, epd.height), 255) #255: white, clear the frame
draw = ImageDraw.Draw(Himage)

# Drawing function Arguments:
# draw.rectangle((x1, y1, x2, y2), outline=0, fill=None)
# draw.arc((x1, y1, x2, y2), startAngle, endAngle, fill=0), (x1, y1, x2, y2) bounding box of the ellipse that the arc
is part of
# draw.chord((x1, y1, x2, y2), startAngle, endAngle, outline=0, fill=None), different to arc as it will close the
shape and allow fill colour
# draw.line((x1, y1, x2, y2), fill=0, width=1)

while True:
    # Generate a random pattern
    draw.rectangle((random.randint(10, epd.width-10), random.randint(10, epd.height-10),
random.randint(10, epd.width-10), random.randint(10, epd.height-10)), outline=0)

    # Display the generated image
    epd.display(epd.getbuffer(Himage))

    # Hold the frame for 2 seconds
    time.sleep(2)

# logging.info("Goto Sleep...")
# epd.sleep()

except IOError as e:
    logging.info(e)

except KeyboardInterrupt:
    logging.info("ctrl + c:")
    epd7in5_V2.epdconfig.module_exit(cleanup=True)
    exit()

```

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