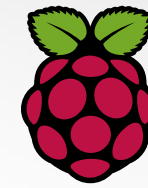


# Ejecutar JMRI en una Raspberry Pi Modelo 3 B+

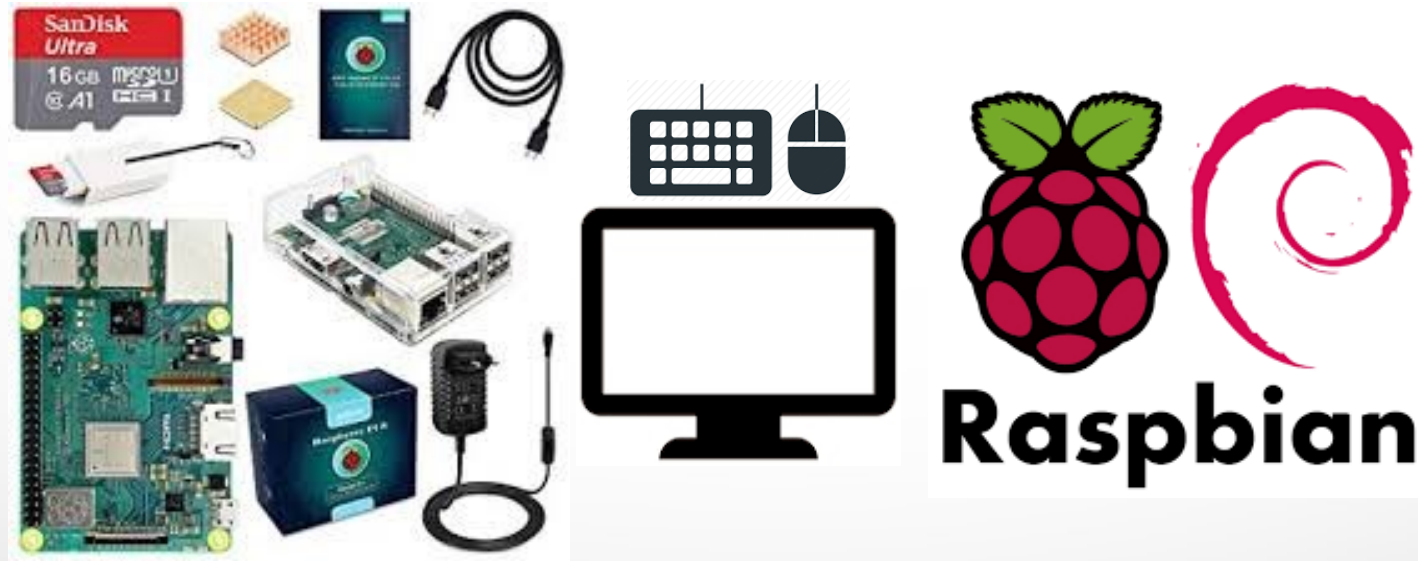


Ejecutar JMRI-PanelPro en una  
Raspberry Pi modelo 3 B+  
con sistema operativo  
Linux Raspbian.

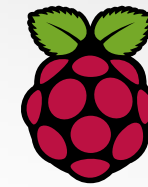
# ¿Qué es una Raspberry Pi?



- La Raspberry Pi es un mini-ordenador de arquitectura ARM de bajo coste (unos 34€ aproximadamente), desarrollado en el Reino Unido por la Fundación Raspberry Pi. El objetivo principal es estimular la enseñanza de las ciencias de la computación a los jóvenes, pero se ha popularizado como Plataforma para diseños y para usos informáticos generales.
- La Fundación da soporte a diferentes distribuciones de Linux adaptadas a la arquitectura ARM entre las que destaca Raspbian, derivada de Debian.



# Partes de la Raspberry Pi:



| Raspberry Pi 3 Model B (J8 Header) |                      |    |      |       |                      |
|------------------------------------|----------------------|----|------|-------|----------------------|
| GPIO#                              | NAME                 |    | NAME | GPIO# |                      |
|                                    | 3.3 VDC Power        | 1  |      | 2     | 5.0 VDC Power        |
| 8                                  | GPIO 8 SDA1 (I2C)    | 3  |      | 4     | 5.0 VDC Power        |
| 9                                  | GPIO 9 SCL1 (I2C)    | 5  |      | 6     | Ground               |
| 7                                  | GPIO 7 GPCLK0        | 7  |      | 8     | GPIO 15 TxD (UART)   |
|                                    | Ground               | 9  |      | 10    | GPIO 16 RxD (UART)   |
| 0                                  | GPIO 0               | 11 |      | 12    | GPIO 1 PCM_CLK/PWM0  |
| 2                                  | GPIO 2               | 13 |      | 14    | Ground               |
| 3                                  | GPIO 3               | 15 |      | 16    | GPIO 4               |
|                                    | 3.3 VDC Power        | 17 |      | 18    | GPIO 5               |
| 12                                 | GPIO 12 MOSI (SPI)   | 19 |      | 20    | Ground               |
| 13                                 | GPIO 13 MISO (SPI)   | 21 |      | 22    | GPIO 6               |
| 14                                 | GPIO 14 SCLK (SPI)   | 23 |      | 24    | GPIO 10 CE0 (SPI)    |
|                                    | Ground               | 25 |      | 26    | GPIO 11 CE1 (SPI)    |
| 30                                 | SDA0 (I2C ID EEPROM) | 27 |      | 28    | SCL0 (I2C ID EEPROM) |
| 21                                 | GPIO 21 GPCLK1       | 29 |      | 30    | Ground               |
| 22                                 | GPIO 22 GPCLK2       | 31 |      | 32    | GPIO 26 PWM0         |
| 23                                 | GPIO 23 PWM1         | 33 |      | 34    | Ground               |
| 24                                 | GPIO 24 PCM_FS/PWM1  | 35 |      | 36    | GPIO 27              |
| 25                                 | GPIO 25              | 37 |      | 38    | GPIO 28 PCM_DIN      |
|                                    | Ground               | 39 |      | 40    | GPIO 29 PCM_DOUT     |

## Raspberry Pi 3 Model B

Dimensions  
85.6mm x 56mm x 21mm



40 Pin  
Extended GPIO

Broadcom  
BCM2837 64bit  
Quad Core CPU  
at 1.2GHz,  
1GB RAM

On Board  
Bluetooth 4.1  
Wi-Fi

MicroSD  
Card Slot

DSI Display Port

Micro USB Power Input.  
Upgraded switched  
power source that can  
handle up to 2.5 Amps

4 x USB 2  
Ports

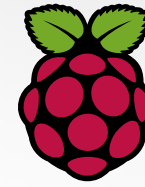
10/100  
LAN Port

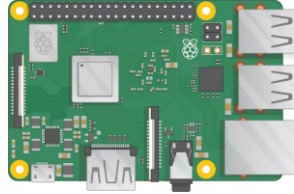





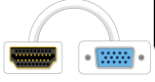




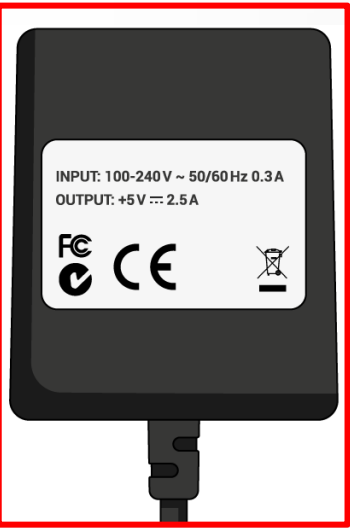
3.5mm 4-pole  
Composite Video  
and Audio  
Output Jack

CSI Camera Port

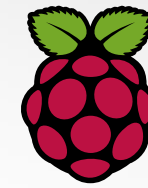
Full Size HDMI  
Video Output





# Material necesario:

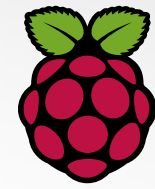


- Raspberry Pi Model 3 B+. 
  - Tarjeta Micro-SD (mínimo 16-32GB).  
    - Class 10
    - UHS Speed Class3
  - Teclado y ratón USB.   
  - Monitor HDMI (conversor VGA o DVI).  
  - Cable Ethernet y conexión a internet. 
  - Alimentador 5 voltios 2,5 Amp. 
  - PC con Windows, Linux o macOS, y un lector de tarjetas Micro-SD. 
- 

# Inversión aproximada:



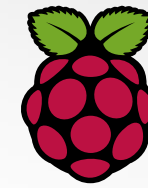
| Producto   | Descripción   | Disponibilidad                 | Precio unitario                        | Cant.    | Total          |
|--|---|--------------------------------|--|----------|----------------|
|   | Raspberry Pi 3 Modelo B+ 1 GB<br>SKU : 2842229  | En stock                       | 33,85 € <b>-13%</b> <del>38,90 €</del> | 1<br>- + | 33,85 €        |
|   | Caja Modular para Raspberry Pi 3 B+<br>SKU : 19coff-bk+<br>Color : Negro              | En stock. Enviado en 24h / 48h | 7,50 €                                 | 1<br>- + | 7,50 €         |
|   | Unidad de fuente de alimentación Micro USB 5,1V 2,5A<br>SKU : SC0136<br>Color : Negro | En stock                       | 7,95 €                                 | 1<br>- + | 7,95 €         |
|  | Carte Micro SD No Name 16 Go Classe 10<br>SKU : XINSD16No                             | En stock                       | 7,50 €                                 | 1<br>- + | 7,50 €         |
| Total productos (impuestos inc.)   |   |                                |  |          | 56,80 €        |
| Total gastos de envío (impuestos inc.)   |   |                                |  |          | 4,96 €         |
| <b>TOTAL</b>   |   |                                |  |          | <b>61,76 €</b> |



# Pasos para instalar Raspbian:

1. Descargar Raspbian y Etcher (herramienta para grabar imágenes en formato *img* de Sistemas Operativos).
2. Descomprimir archivo ZIP Raspbian descargado.
3. Preparar tarjeta Micro-SD con Etcher y archivo descomprimido.
4. Conectar cables a la Raspberry.
5. Arrancar Raspberry.
6. Personalizar Raspbian.
7. Conectividad con Raspbian.

# Descargar Rasbian y Etcher:



## Raspbian:

- Descarga de Raspberry Pi con el JMRI preinstalado.

[https://drive.google.com/file/d/1Yu\\_au-CNrGnOoHKo d2OwTj0FH4nPh1LN/view?usp=sharing](https://drive.google.com/file/d/1Yu_au-CNrGnOoHKo d2OwTj0FH4nPh1LN/view?usp=sharing)

### JMRI RaspberryPi as Access Point



Many model railroaders would benefit from using smartphones as Throttles, but most are not computer experts, and may be intimidated by the setup required. To lower this bar, I've preconfigured everything needed to get started, and provide the software free of charge.

First, start with the tiny [RaspberryPi](#) computer (\$35). Download my free, preconfigured image to your SD card. Then simply turn on main power, and the RPI will start up and load JMRI, scanning for your layout hardware connection. It will also start up a dedicated wireless network from the RPI. Within 30 seconds, you can connect your phone(s) or pad(s) to the RPI's Wifi and start running trains! The RPI needs no screen, keyboard or mouse, so it can stay nicely out of the way under the layout, or in your electronics box [\[photo\]](#).

Below are the details of how to get your own JMRI RaspberryPi access point for [EngineDriver](#) and [WiThrottle](#) devices:

#### Hardware

| Item                                   | Purchase               |
|--|------------------------|
| RaspberryPi 3 Model B+                 | <a href="#">Newark</a> |
| 5V 2.5A Power Supply w/ MicroUSB Cable | <a href="#">NewEgg</a> |
| 8Gb MicroSD memory card                | <a href="#">NewEgg</a> |
| RPI Case with Lid (**optional)         | <a href="#">Newark</a> |

#### Software Image

I have built an image file which contains all software and config needed to autostart JMRI PanelPro on the RPI, as an access point, with WiThrottle Server, Web Server and LoconetOverTCP (or JMRI Simple) server included. Also included is remote access to the RPI via ssh (command line) and to the RPI "desktop" via VNCServer (at port :5900) Download the [zipped image file \[here\]](#) (1.4Gb, updated April 21, 2019), or the previous version [\[here\]](#) (1.3Gb, updated January 3, 2019). NOTE: Ignore the "too large" warnings and click "Download".

The image features:

- Autoidentification of attached hardware (Locobuffer-USB, PR3, SPROG, LENZ USB, NCE Serial, NCE USB, DCC++, EasyDCC Serial, MERG USB, MRC Prodigy)
- Autostart of PanelPro with WiThrottle and Web Server.
- Creates network access point for device connection, or can be plugged into existing network

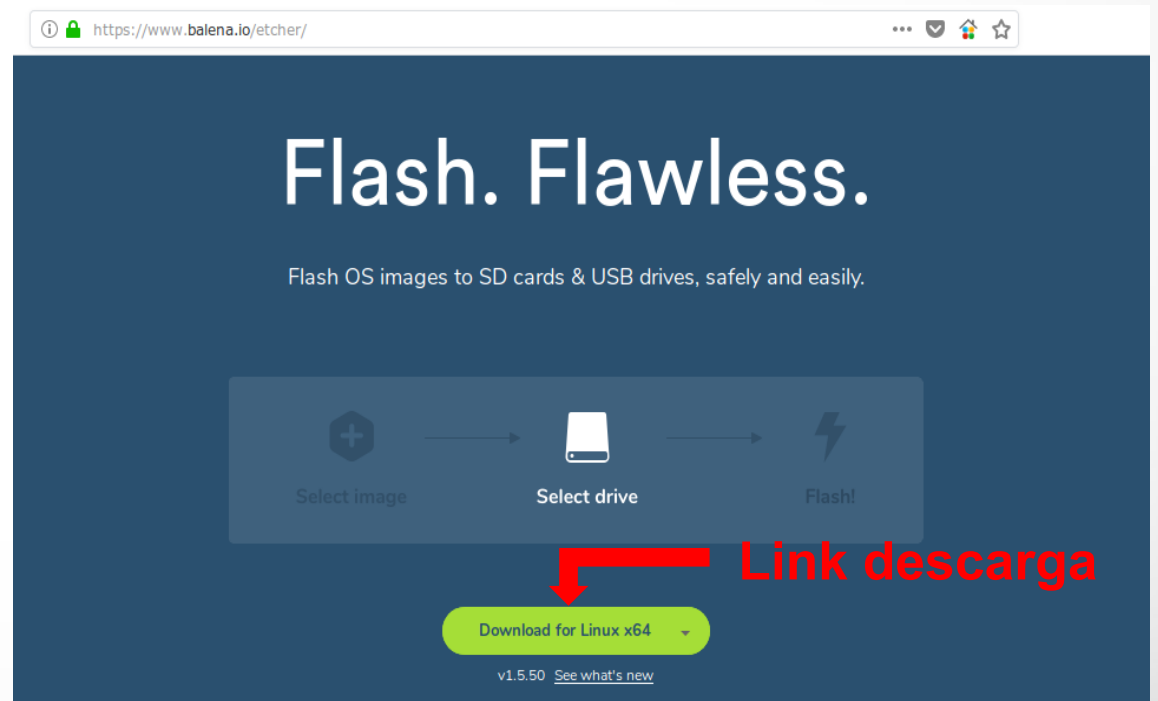
**Link descàrrega**

## Etcher:

- Página oficial de Etcher.

<https://www.balena.io/etcher/>

**Versiones:** Windows (portable) - Linux - macOS



Flash. Flawless.

Flash OS images to SD cards & USB drives, safely and easily.

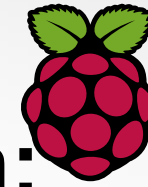
Select image → Select drive → Flash!

**Link descarga**

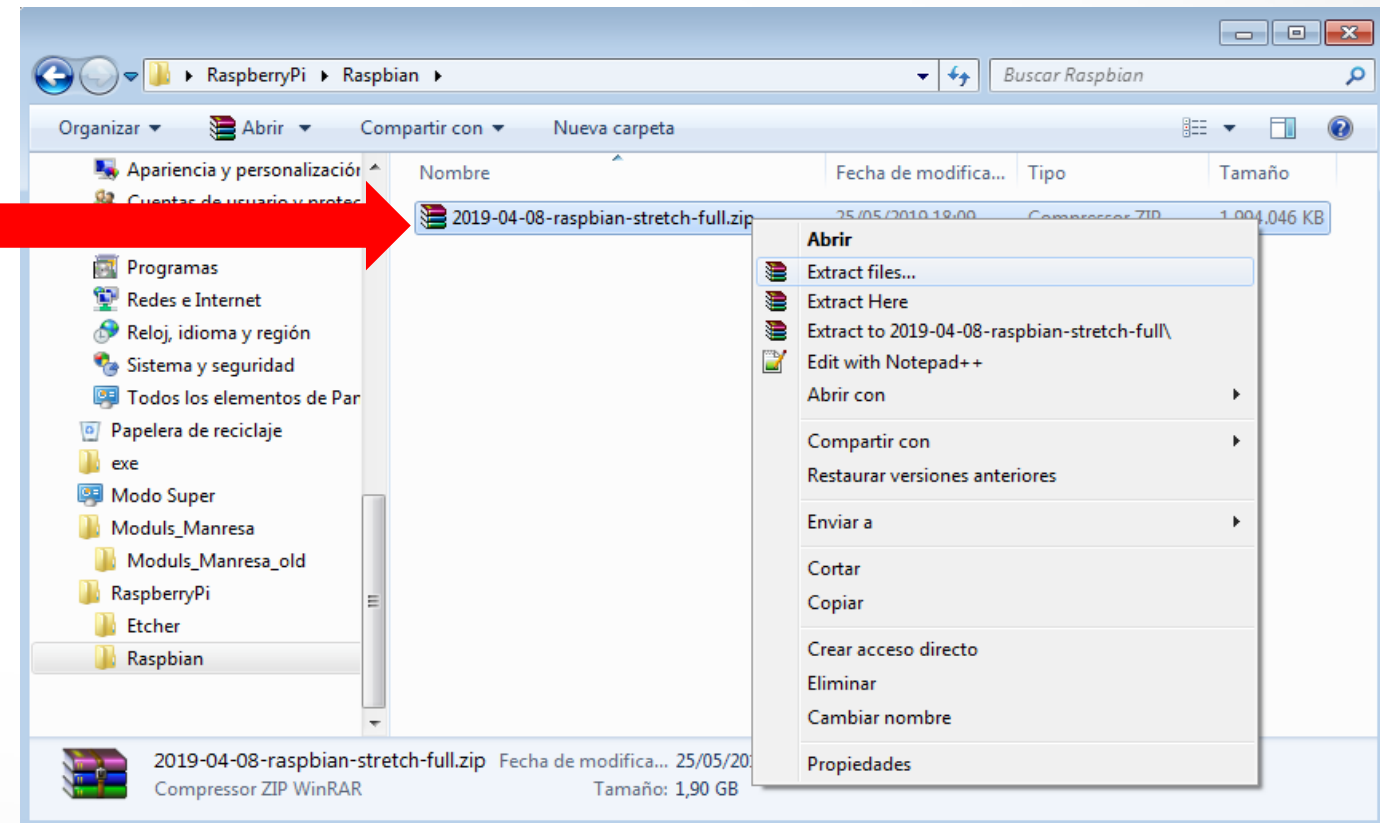
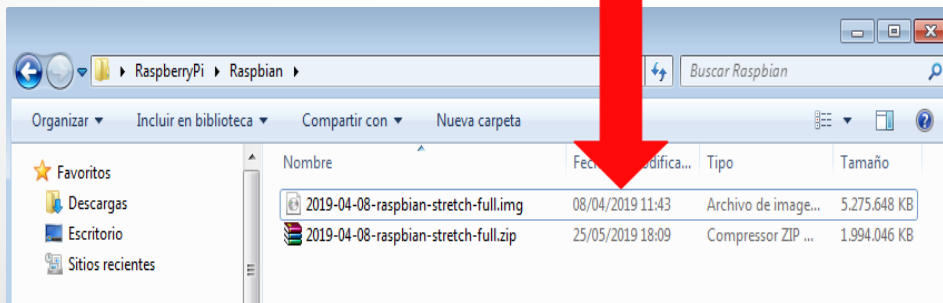
Download for Linux x64

v1.5.50 [See what's new](#)

# Descomprimir archivo zip de Raspbian:



1. Seleccionamos el archivo descargado de Raspbian y con el botón secundario del ratón, se tiene que descomprimir el archivo zip; lo podemos hacer con *WinZip*, *Winrar*, *7zip* (Linux) o *Unarchiver* (Macintosh), obtendremos un nuevo archivo con extensión *img*.
2. El archivo *img* contiene el Sistema operativo Raspbian, es el que utilizaremos con la utilidad Etcher.

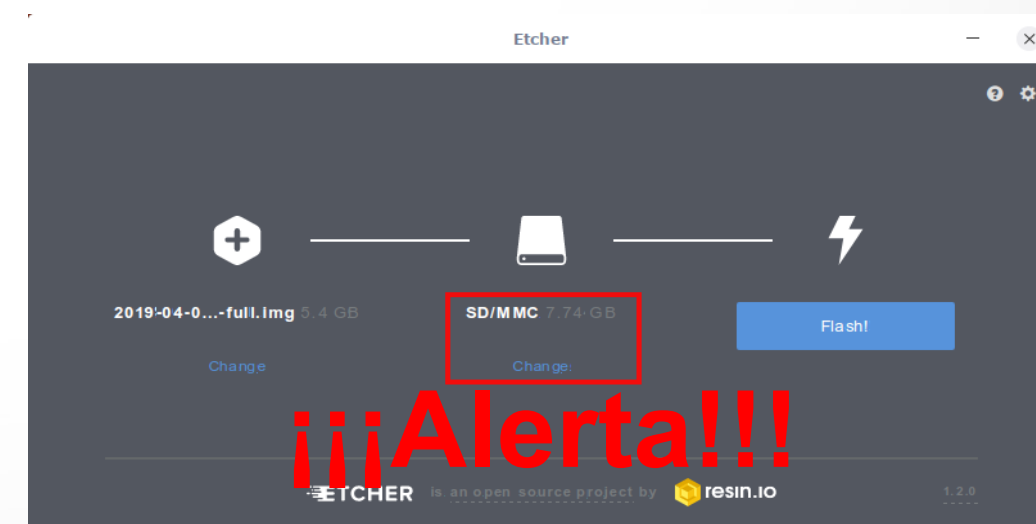
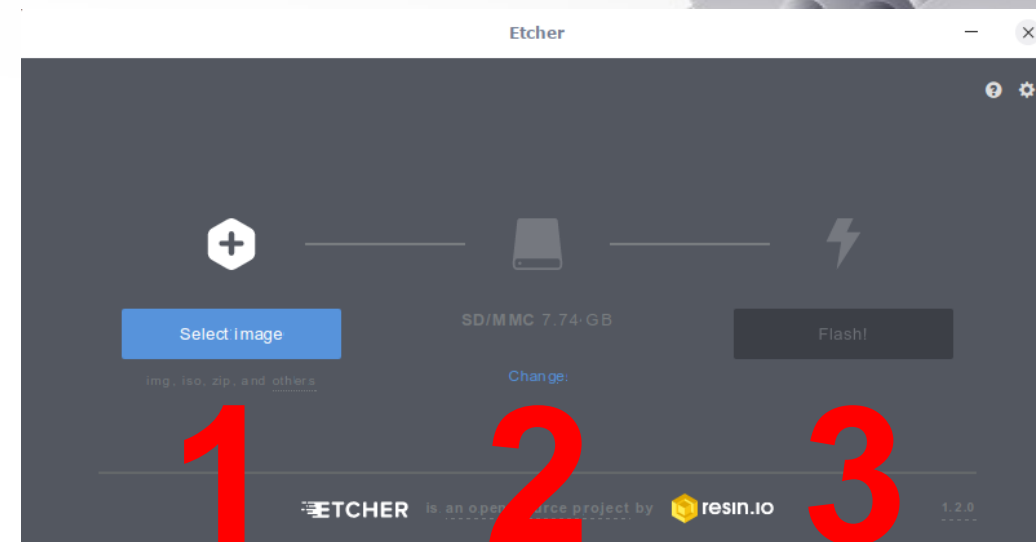
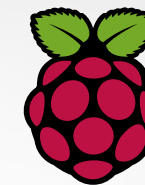




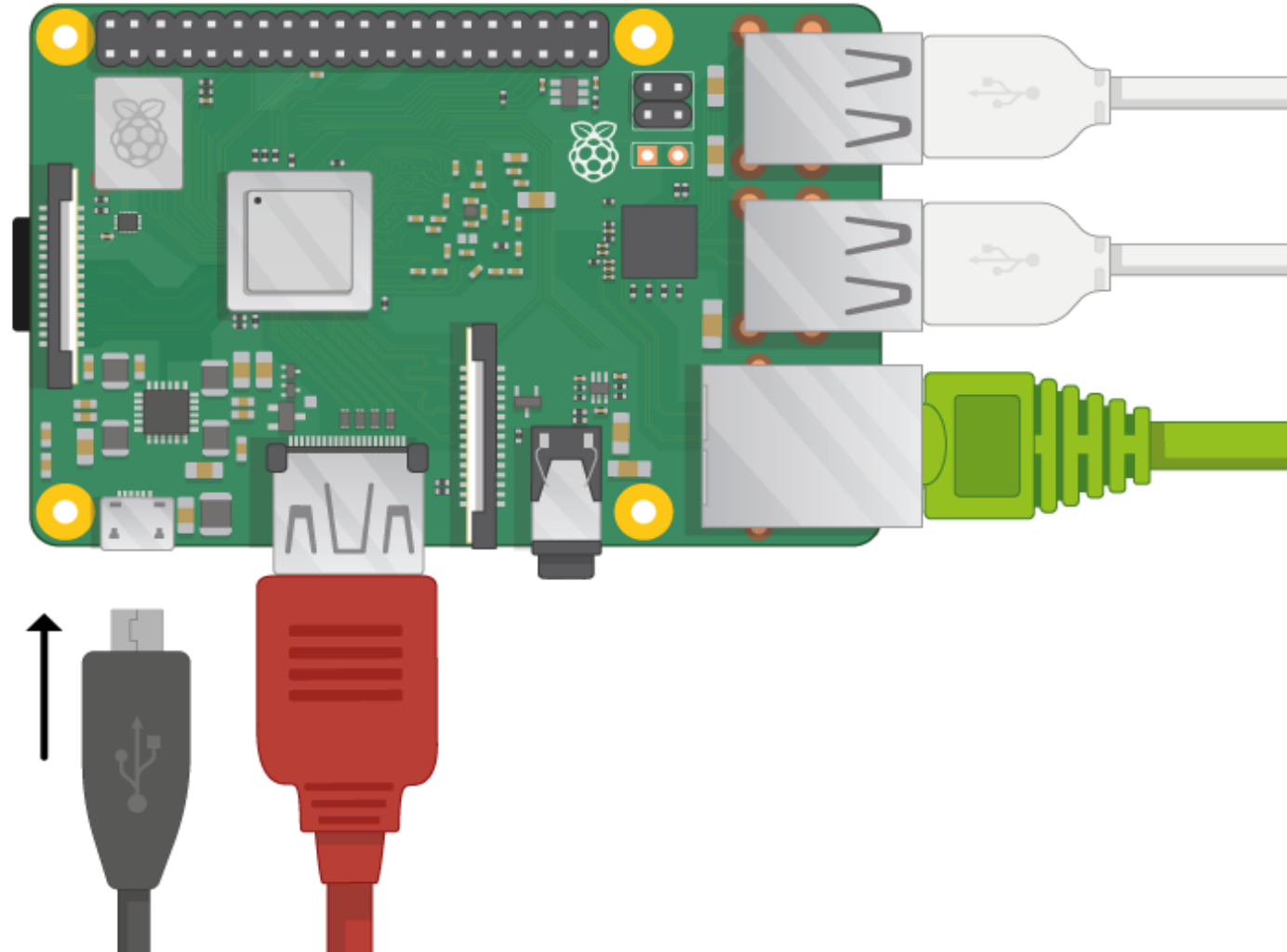
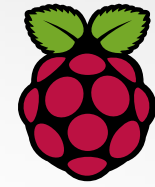
# Preparar tarjeta Micro-SD:

Insertamos la tarjeta Micro-SD en el lector del PC:

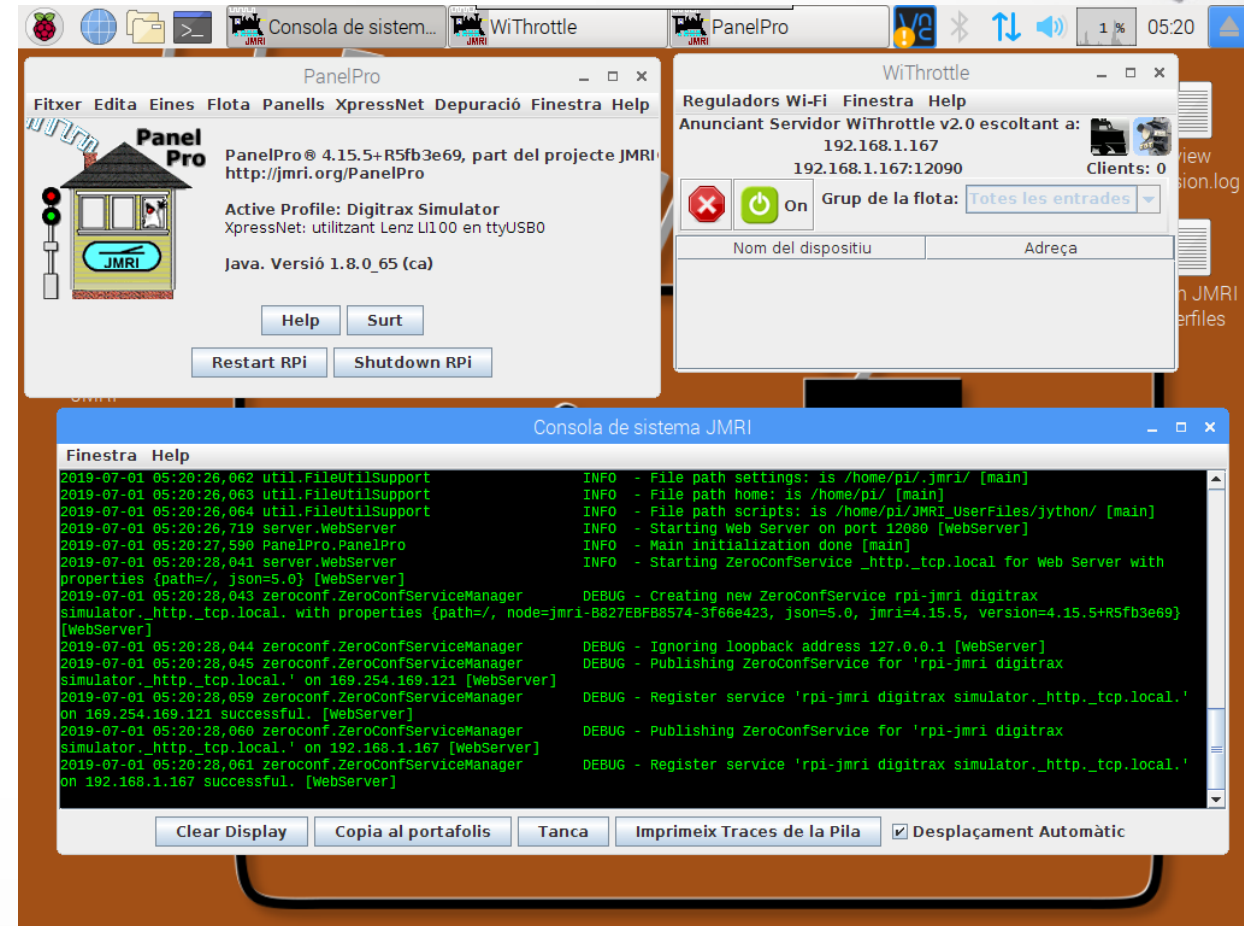
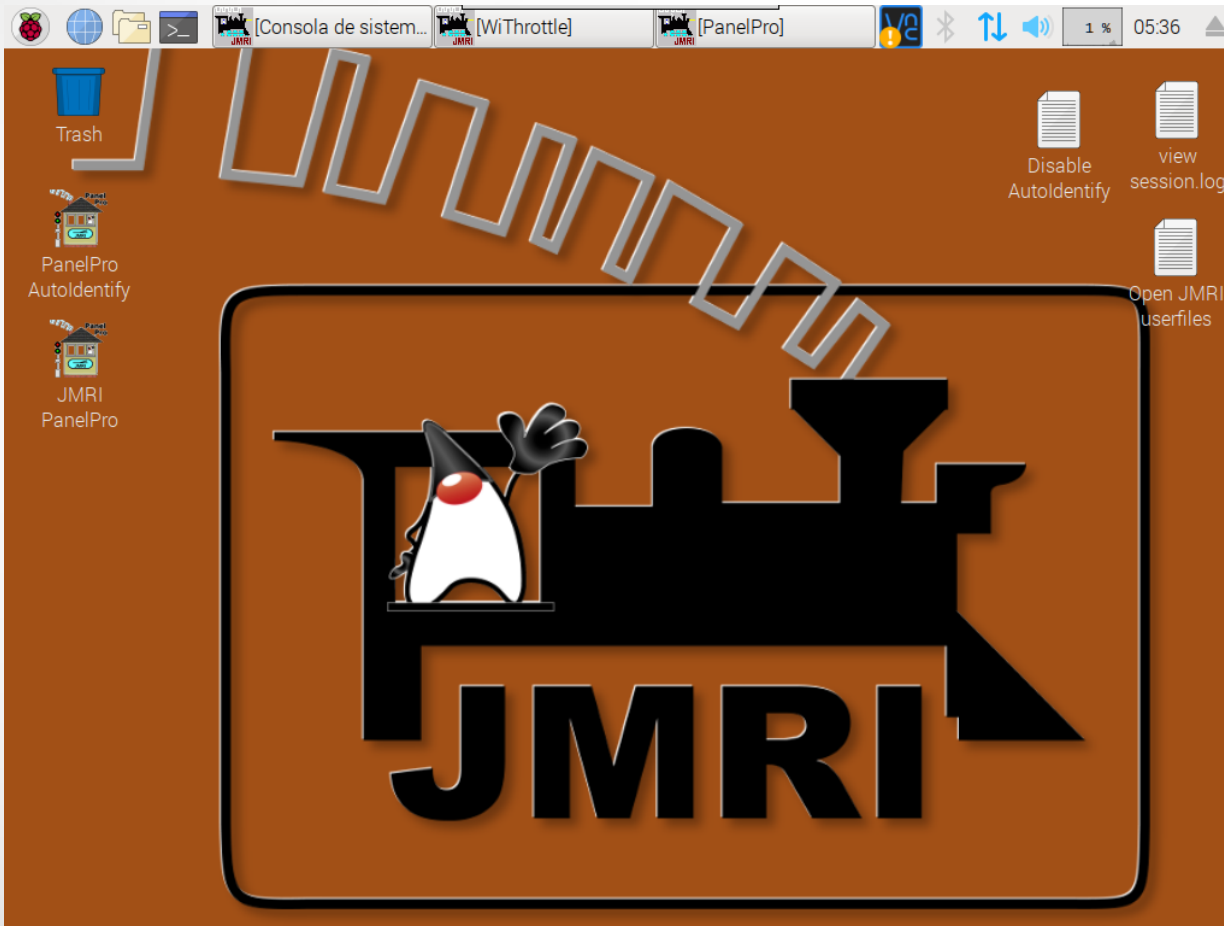
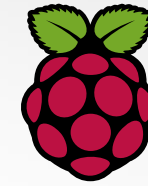
1. En la utilidad Etcher clicamos en **“Select image”** para seleccionar el archivo *img* de Raspbian que acabamos de descomprimir.
2. **Nos aseguramos** de seleccionar la tarjeta Micro-SD correcta.
3. Clicamos en **“Flash”** para iniciar el proceso y esperamos a que finalice (+/- 15 minutos).



# Conectar cables a la Raspberry:

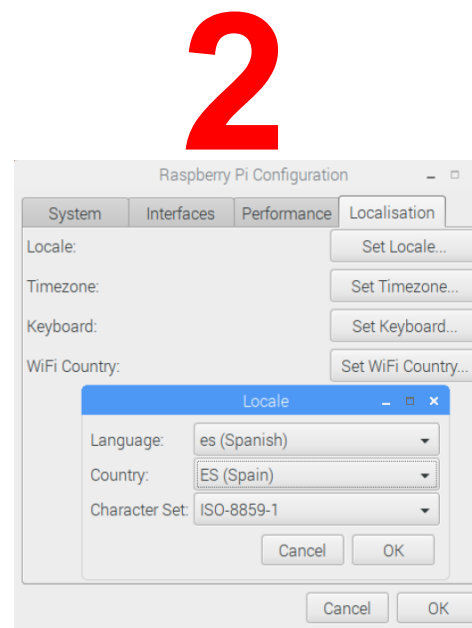
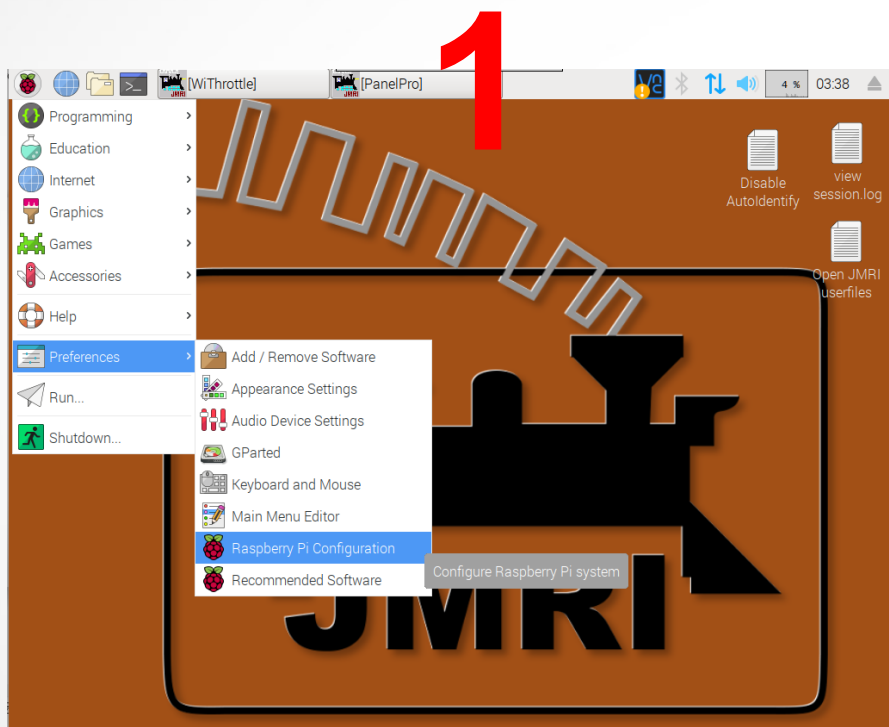
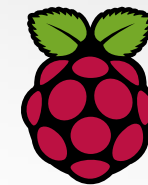


# Arrancar Raspberry:

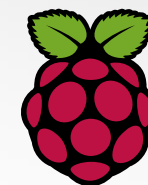


# Personalizar Raspbian:

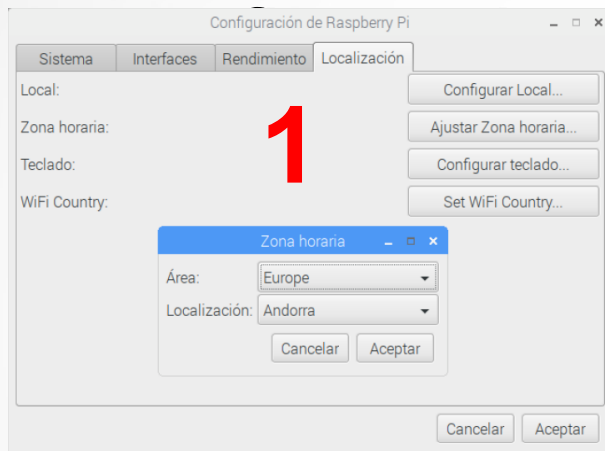
- Cambiar idioma y reiniciar el sistema:



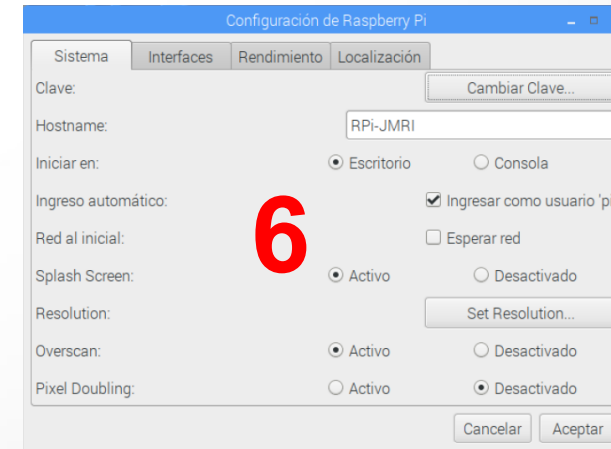
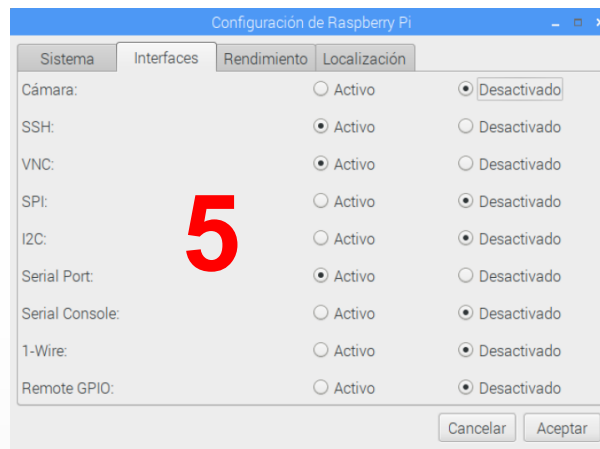
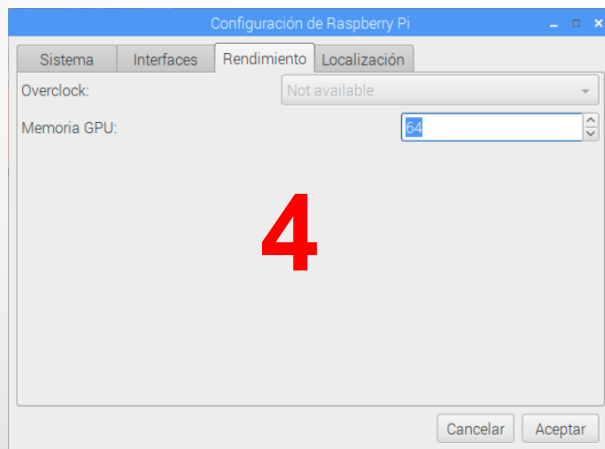
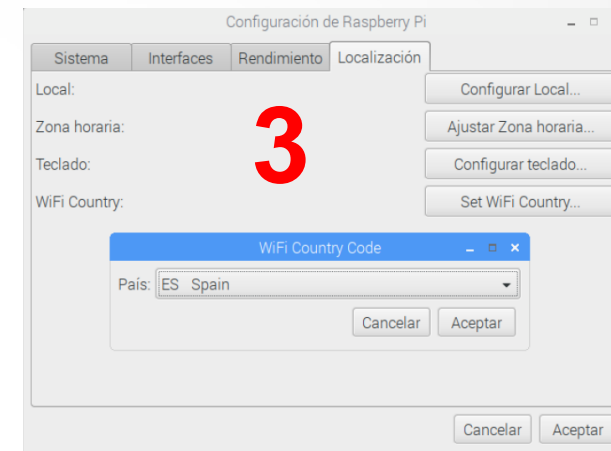
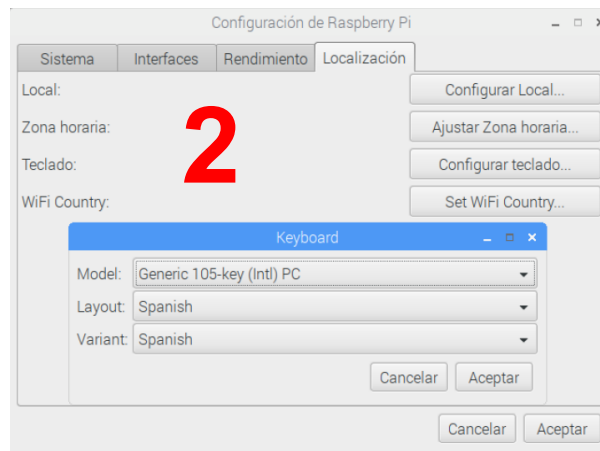
# Personalizar Raspbian:



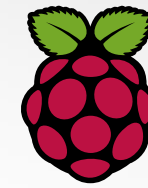
- Cambiar huso horario, teclado, región de Wifi y otros



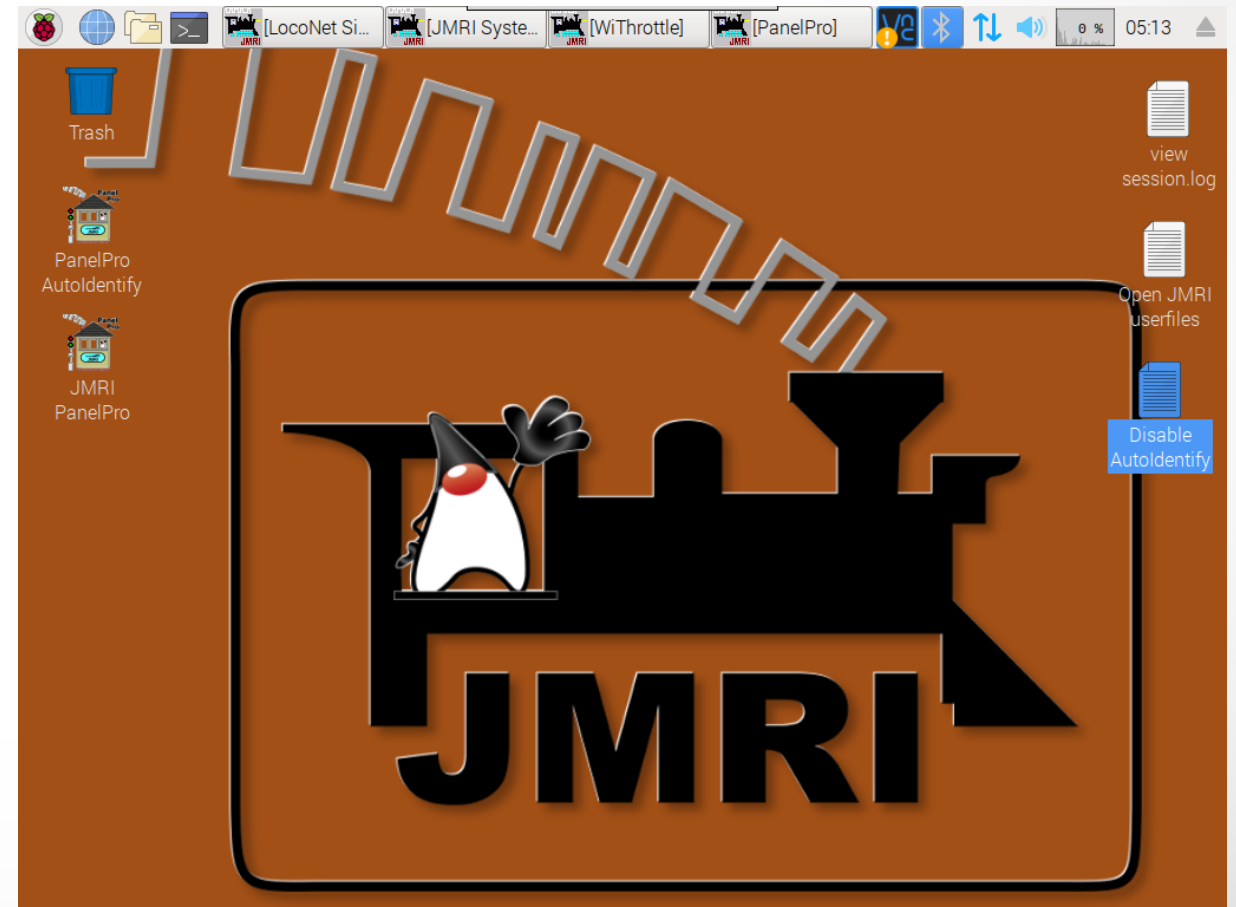
S:

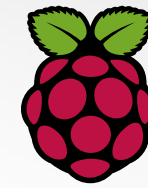


# Conectividad con Raspbian:



## Servidor VNC (contraseña “rpl-jmri”):





# Conectividad con Raspbian:

## Servidor ssh (usuario "pi", contraseña "rpl-jmri"):

