

# Display for Raspberry Pi - Installation

## General

In our affiliate a couple of screens are installed with a **Raspberry Pi**. This Pi has a display connected to it and runs a script that shows a **Node-Red UI** (User Interface). This page is made for everyone who wants to install a Pi screen and automatically open a **kiosk** page that shows you **information** about the data that it is currently measuring/monitoring.

## Hardware

### Components

- 1x metal case shield

#### Front side



#### Back side



- 1x metal mount



- 4x washers (rondellen)



- 1x RJ-45 feed-through adaptor (<https://be.farnell.com/neutrik/ne8fdp/in-line-adaptor-rj45-8p-jack-jack/dp/1202032>)



- 1x USB C female to female adapter ([https://www.amazon.com.be/-/en/QIANRENON-Coupler-Transmission-Industrial-Equipment/dp/B09XDWFYRP/ref=asc\\_df\\_B09XDWFYRP/?tag=begogshpadde-21&linkCode=df0&hvadid=632969126821&hvpos=&hvnetw=g&hvrnd=1292399926429280802&hvpon=&hvptwo=&hvqmt=&hvdev=c&hvdvcmdl=&hvlocint=&hvlocphy=1001080&hvtargid=pla-1738243944939&psc=1&gclid=EAlalQobChMllc7d-KqG\\_gIVtRMGAB0d8gWeEAQYAiABEgK4avD\\_BwE](https://www.amazon.com.be/-/en/QIANRENON-Coupler-Transmission-Industrial-Equipment/dp/B09XDWFYRP/ref=asc_df_B09XDWFYRP/?tag=begogshpadde-21&linkCode=df0&hvadid=632969126821&hvpos=&hvnetw=g&hvrnd=1292399926429280802&hvpon=&hvptwo=&hvqmt=&hvdev=c&hvdvcmdl=&hvlocint=&hvlocphy=1001080&hvtargid=pla-1738243944939&psc=1&gclid=EAlalQobChMllc7d-KqG_gIVtRMGAB0d8gWeEAQYAiABEgK4avD_BwE))



Front Type-c interface



Rear Type-c interface

- 1x Raspberry Pi 4B (<https://www.raspberrypi.com/products/raspberry-pi-4-model-b/>)

- 1x SD card 32GB ([https://www.coolblue.be/nl/product/873813/sandisk-microsdhc-ultra-32gb-120-mb-s-cl10-a1-uhs-1-sd-ada.html?cmt=c\\_a%2Ccid\\_15795733585%2Caid\\_131618942763%2Ctid\\_aud-918309158136%3Apla-360320234784%2Cgn\\_g%2Cd\\_c&gclid=Cj0KCQjwk7ugBhDIARIsAGuvGpBwGgGBQog2P82rGI7glAHkyGPFbweJR5B7eW8aewKg-qgZdrj2q14aAjwQEALw\\_wcB](https://www.coolblue.be/nl/product/873813/sandisk-microsdhc-ultra-32gb-120-mb-s-cl10-a1-uhs-1-sd-ada.html?cmt=c_a%2Ccid_15795733585%2Caid_131618942763%2Ctid_aud-918309158136%3Apla-360320234784%2Cgn_g%2Cd_c&gclid=Cj0KCQjwk7ugBhDIARIsAGuvGpBwGgGBQog2P82rGI7glAHkyGPFbweJR5B7eW8aewKg-qgZdrj2q14aAjwQEALw_wcB))



- 1x HMTECH 10" display (<https://www.amazon.com/HMTECH-Raspberry-Touchscreen-1024x600-Portable/dp/B0987468N2>)



- 1x RJ45 Ethernet cable ([https://www.allekabels.be/utp-netwerk-kabel/26/1098194/uutp-kabel-cat-5e.html?gclid=Cj0KCQjwk7ugBhDIARIsAGuvGPaRzGBJZmx-pE7B0oXP6UvpSw\\_zw-ttYOJAX10AUAnR24n9yMiq--waAokyEALw\\_wcB](https://www.allekabels.be/utp-netwerk-kabel/26/1098194/uutp-kabel-cat-5e.html?gclid=Cj0KCQjwk7ugBhDIARIsAGuvGPaRzGBJZmx-pE7B0oXP6UvpSw_zw-ttYOJAX10AUAnR24n9yMiq--waAokyEALw_wcB))



- 1x USB-C male to male adapter ([https://www.allekabels.be/usb\\_accessoires/usb\\_c\\_kabel/usb-c-naar-usb-c.html](https://www.allekabels.be/usb_accessoires/usb_c_kabel/usb-c-naar-usb-c.html))

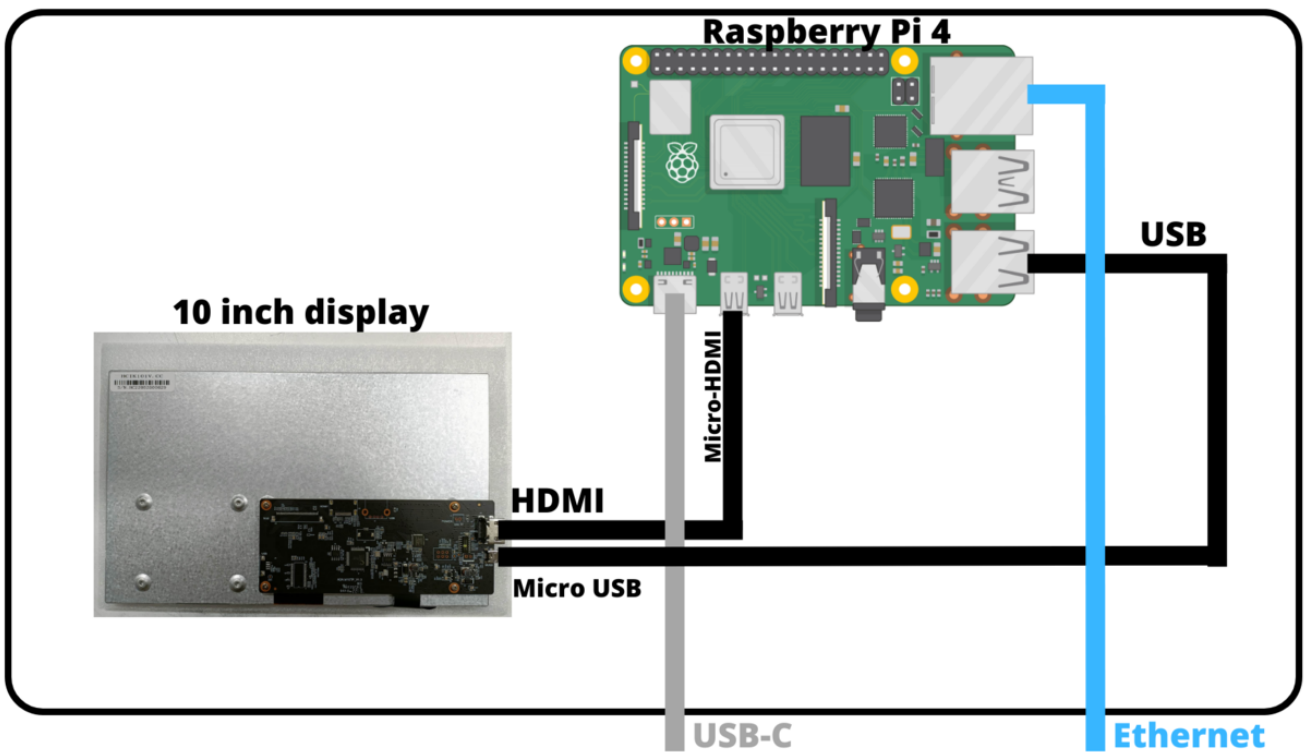


- 1x USB micro cable (included with display)

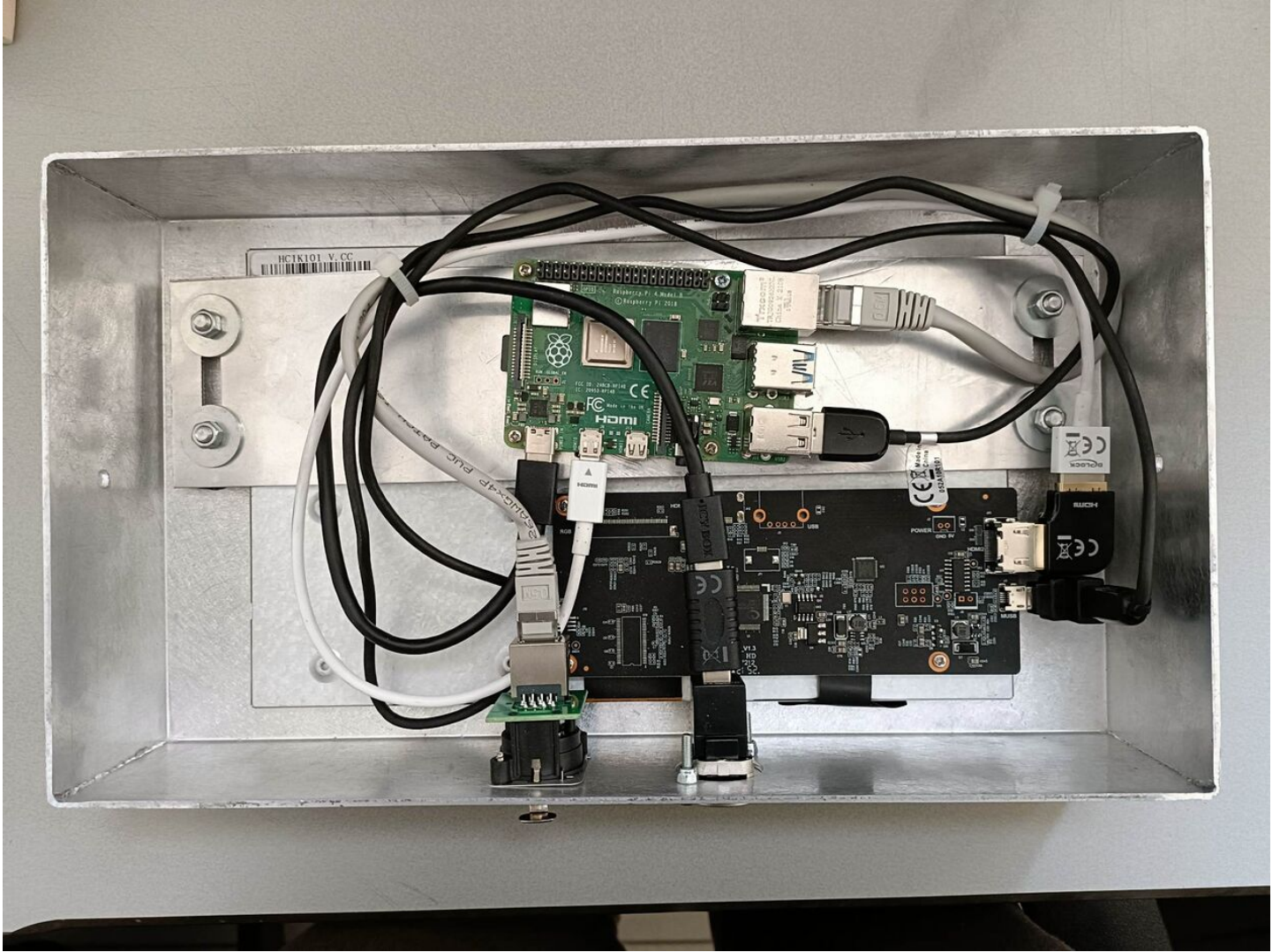


## Build

The connections should be made according to the schematic below. When finished, it should look like this.



You can use zip-ties to make the inside more clean.
















## Software

### Step 1: Flash SD card

Download the latest version of the raspbian OS (<https://downloads.raspberrypi.org/raspbian/images/>).

# Index of /raspbios\_armhf/images

<u>Name</u>	<u>Last modified</u>	<u>Size</u>	<u>Description</u>
 <a href="#">Parent Directory</a>		-	
 <a href="#">raspbios_armhf-2020-05-28/</a>	2020-05-28 06:02	-	
 <a href="#">raspbios_armhf-2020-08-24/</a>	2020-08-24 17:20	-	
 <a href="#">raspbios_armhf-2020-12-04/</a>	2020-12-04 07:08	-	
 <a href="#">raspbios_armhf-2021-01-12/</a>	2021-01-12 15:28	-	
 <a href="#">raspbios_armhf-2021-03-25/</a>	2021-03-25 15:36	-	
 <a href="#">raspbios_armhf-2021-05-28/</a>	2021-05-28 16:08	-	
 <a href="#">raspbios_armhf-2021-11-08/</a>	2021-11-08 07:49	-	
 <a href="#">raspbios_armhf-2022-01-28/</a>	2022-01-28 16:53	-	
 <a href="#">raspbios_armhf-2022-04-07/</a>	2022-04-07 12:03	-	
 <a href="#">raspbios_armhf-2022-09-07/</a>	2022-09-07 05:18	-	
 <a href="#">raspbios_armhf-2022-09-26/</a>	2022-09-26 09:37	-	
 <a href="#">raspbios_armhf-2023-02-22/</a>	2023-02-22 11:31	-	

Use Imas Imager to flash your SD

card.

Imas Imager



Van Genechten - Imas  
**Imager**

When done it will look like this.

Download from server

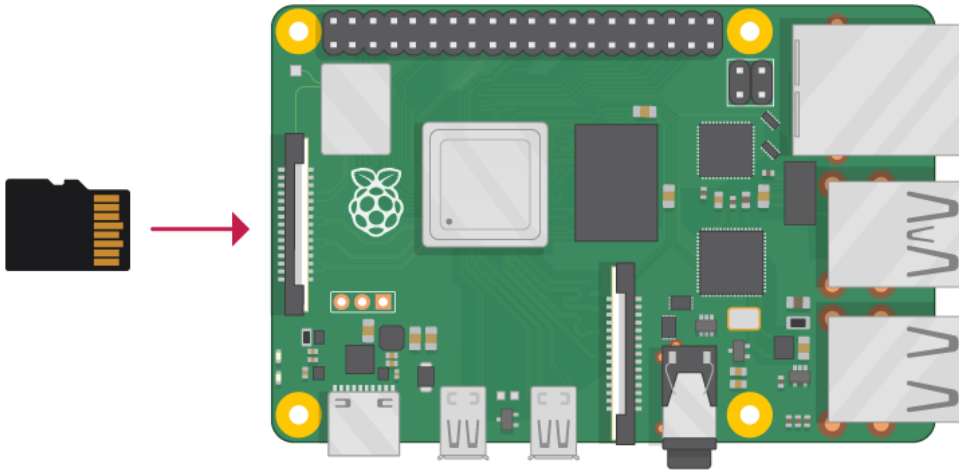
Operating system	Storage device	Write Image
2023-02-21-raspbios-bullseye-armhf	Choose Storage Device	Burn

All Done - Wrote 11228151808 bytes. Elapsed time 00:00:02:15

Safely remove your **SD card**. You are now ready to set up the **OS**.

## Step 2: Setup Raspberry Pi

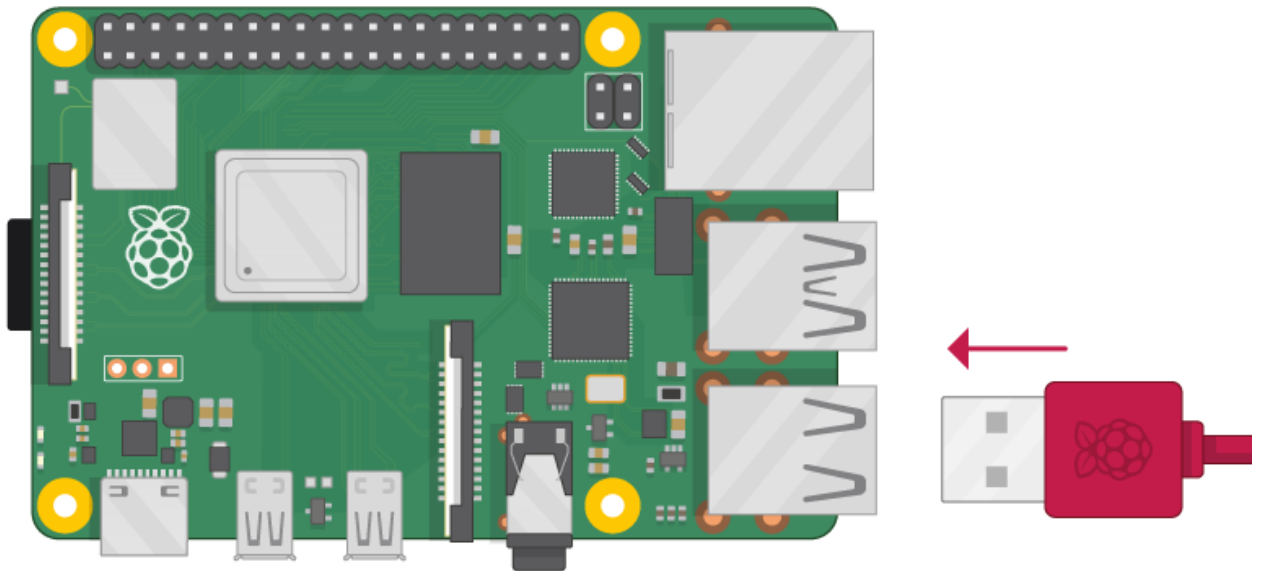
First insert your recently flashed micro SD card into the slot on your Raspberry Pi.



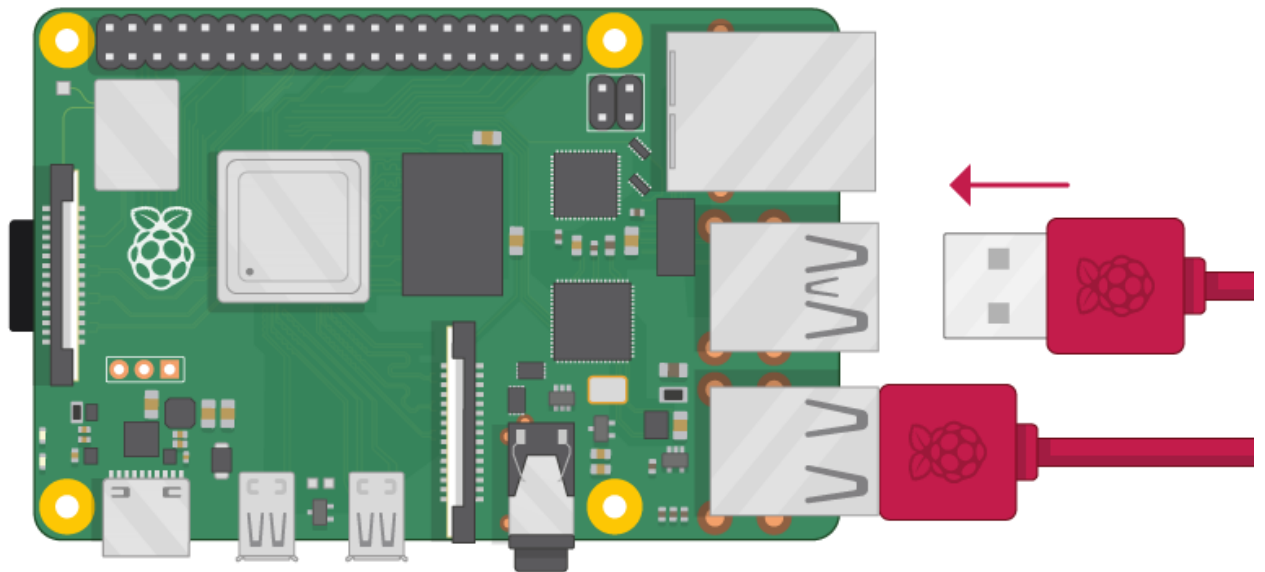
To easily access the

**GUI**, you should plug in a mouse and keyboard.

- Find the USB connector end of your mouse's cable, and connect the mouse to a USB port on Raspberry Pi (it doesn't matter which port you use).



- Connect the keyboard in the same way.



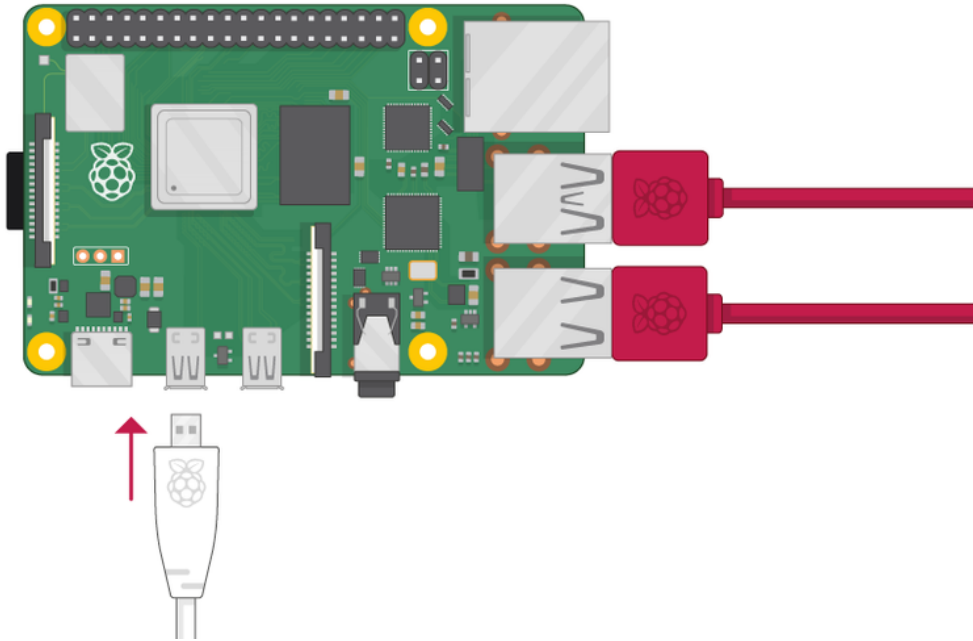
- Make sure your screen is switched on.
- Look at the HDMI port(s) on your Raspberry Pi – notice that they have a flat side on top.
- Use a cable to connect the screen to Raspberry Pi's HDMI port – use an adapter if necessary.

#### Raspberry Pi 4

- Connect your screen to the first of Raspberry Pi 4's HDMI ports, labelled **HDMI0**.

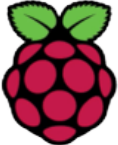


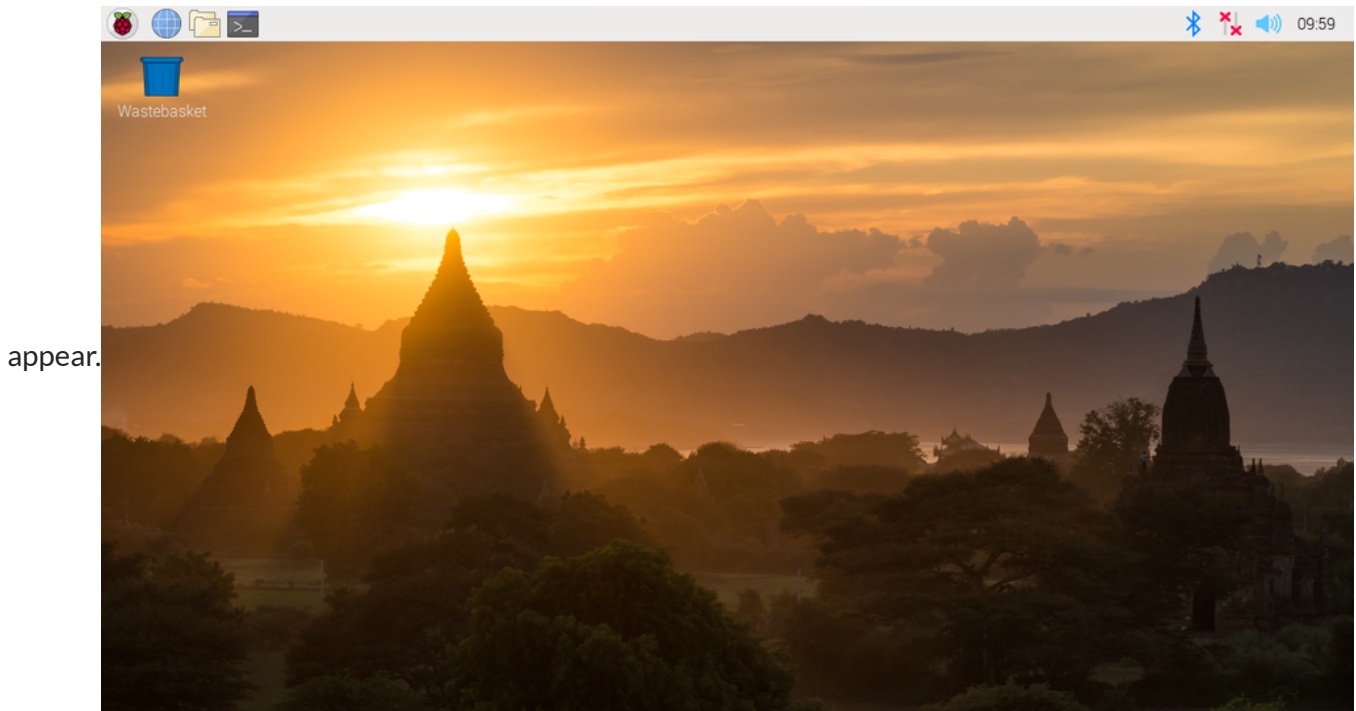
**Note:** Make sure you have used HDMI0 (nearest the power in port) rather than HDMI1.



## Step 3: Boot

You should see a **red LED** light up on the Raspberry Pi, which indicates that Raspberry Pi is connected to power. As it starts up (this is also called booting), you will see raspberries appear in the top left-hand corner of your

screen.  **Raspberry Pi OS** After a few seconds the **Raspberry Pi OS** desktop will



## Finishing the setup

When you start your Raspberry Pi for the first time, the Welcome to Raspberry Pi application will pop up and guide you through the initial setup.

If your ethernet is connected to the network, you should find an **IP address** in the bottom right corner.

IP address: 10.x.x.x

Copy Code

**WRITE THIS DOWN!** It will be necessary later in the installation.



Welcome to the Raspberry Pi Desktop!

Before you start using it, there are a few things to set up.

Press 'Next' to get started.

If you are using a Bluetooth keyboard or mouse, put them into pairing mode and wait for them to connect.

Next

- Click on Next to start the setup.
- Set your Country, Language, and Timezone, then click on Next again.

### Set Country

Enter the details of your location. This is used to set the language, time zone, keyboard and other international settings.

Country:

Language:

Timezone:

Use English language  Use US keyboard

Press 'Next' when you have made your selection.

- Enter a new username and password for your Raspberry Pi and click on Next.

Username: **pi**

Password: Enter the Raspberry Pi password from **Keepass**.

### Create User

You need to create a user account to log in to your Raspberry Pi.

The username can only contain lower-case letters, digits and hyphens, and must start with a letter.

Enter username:

Enter password:

Confirm password:

Hide characters

Press 'Next' to create your account.

- The next steps are not really important for this installation.
- Click **Next, update and reboot**.

- After reboot you are ready to install some necessary modules.

## Step 4: Installations

Open a terminal. 

### VNC server

Install VNC-server for remote connection.

```
sudo apt-get update  
sudo apt-get install realvnc-vnc-server
```

Copy Code

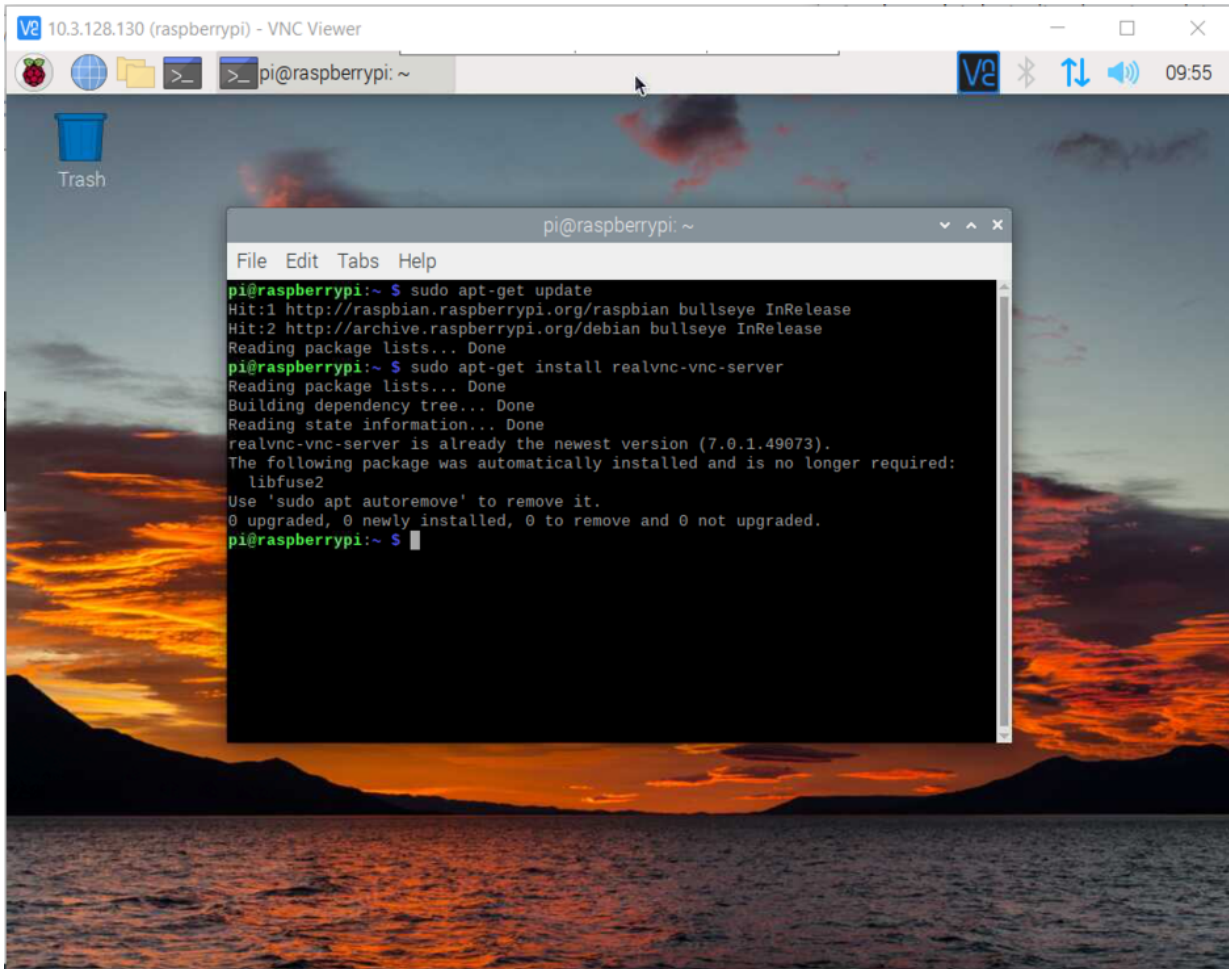
Enable VNC in the graphical desktop.

**Menu > Preferences > Raspberry Pi Configuration > Interfaces.** You will come across VNC in there. Make sure it's **Enabled**. Once you've done that, the software will start every time you boot.

Setup a remote connection with your Raspberry Pi.

- Install VNC Viewer (<https://www.realvnc.com/en/connect/download/viewer/>)
- Enter the IP address

- Enter credentials



Now you no longer need the additional mouse and keyboard. You can unplug them if you want.

## Firefox

```
sudo apt-get install firefox-esr
```

Copy Code

## Browser startup script

Create a `browser_startup.sh` script.

```
sudo nano browser_startup.sh
```

Copy Code

Copy-paste this code and replace the IP address and URL

```
#!/bin/bash
i=0
while ! ping -c 1 -n -w 1 "Node-red IP address" &> /dev/null
do
    ((i++))
```

Copy Code

```
done
export DISPLAY=:0.0
firefox --kiosk "Node-Red-UI-url"
```

**NOTE:** The IP address has no double quotes. The URL is a string so it requires double quotes.

Set the script **executable** permission by running **chmod** command.

```
sudo chmod +x browser_startup.sh
```

Copy Code

## Autostart Node-Red UI

The user **autostart** file and associated path does not exist by default.

The pi user autostart needs to be located here: **/home/pi/.config/lxsession/LXDE-pi/** (If not user pi then substitute your username for pi **/home/{user}/.config/lxsession/LXDE-pi/**).

You will first need to create the **lxsession** and **LXDE-pi** sub directories then copy the System autostart to the user(s) location(s).

```
mkdir /home/pi/.config/lxsession
mkdir /home/pi/.config/lxsession/LXDE-pi
cp /etc/xdg/lxsession/LXDE-pi/autostart /home/pi/.config/lxsession/LXDE-pi/
```

Copy Code

Open the autostart configuration.

```
sudo nano /home/pi/.config/lxsession/LXDE-pi/autostart
```

Copy Code

Add the following line to the end of the script.

```
@lxterminal -e "/home/pi/browser_startup.sh"
```

Copy Code

CTRL-O, Enter, CTRL-X and **reboot**

After rebooting the browser starts and shows the Node-red page in full screen.

---

Back to: Demo Boards for VGPIoT (CDP)

Back to: Main Page