

HRP2.0 - Raspberry Pi 4 setup

Setup up Raspberry Pi 4

Burn image

Download and Start Raspberry Pi imager for your PC. <https://www.raspberrypi.com/software/> available for Linux, Windows and Mac

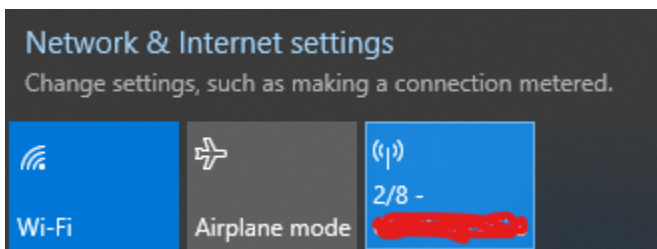
Under "Other general purposes OS" choose Ubuntu Server 20.04.3 LTS (RPI 3/4/400) 64-bit and burn to SD-card.

If the proxy or firewall stops the imager program to download you can get the image from <https://ubuntu.com/download/raspberry-pi> and then chose custom image in the imager program.

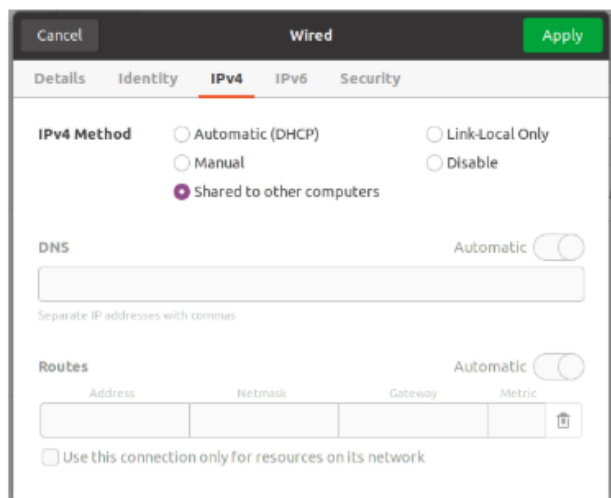
Network first step

Use this guide to configure network: <https://ubuntu.com/tutorials/how-to-install-ubuntu-on-your-raspberry-pi> (you don't need to install a desktop on the Raspberry Pi)

The guide will setup the Raspberry Pi 4 as a WiFi client so you need a WiFi router or use your computer as a Mobile Hotspot. (Enable in the Windows Wifi taskbar menu)



You can also enable your PC ethernet as a DHCP server on a Ubuntu using this setting:



Note that the information in the network-config is only used during first boot of the Raspberry Pi. If you enter wrong information here you need to rerun the imager.

For the first boot use a Wifi on which you can see the connected devices (The Windows Mobile hotspot is useful).

The Pi can later be configured to act as a WiFi acces point or connect to other Wifis.

Boot your Raspberry Pi, make sure it is powered not from a mower, since the mower will shutdown after a while.

Wait for the Pi to connect to the router/hotspot. In Windows you can see active connection by right clicking on the mobile hotspot in the wifi-popup in the taskbar.

Not that the Raspberry Pi 4 cannot connect to 5GHz Wifi-networks.

Configure password and hostname

ssh into the Pi using \$: ssh ubuntu@<ip>

Current password is ubuntu

Set the password to be HusqvarnaHrp2

To access the pi without password run

ssh-copy-id ubuntu@<ip>

If you get the error ERROR: No identities found run the command ssh-keygen first

If you are on WSL and get errors when ssh:ing to the pi follow this guide: <https://esc.sh/blog/ssh-agent-windows10-wsl2/>

To change the hostname of the Pi ssh ubuntu@<ip> and run sudo hostnamectl set-hostname <newhostname>. Chose the name of your mower.

Configure as Wifi access point

The raspberry pi can be configure as a Wifi access point. It is easier to connect to the raspberry pi if you can use it as a access points, instead of configuring your router or PC as something that is known by the raspberry pi.

When connect to the Pi as a wifi access point the pi can normally not access internet, so it is recommended to add a second wifi dongle to to be used as Wifi hotspot. The the pi can still connect to internet using your PC as a mobile hotspot.

To configure the pi as a network hotspot follow this guide: <https://gist.github.com/ExtremeGTX/ea1d1c12dde8261b263ab2fead983dc8> but read this all this text before.

In the guide, change wlan0 to wlan1 if you use an external wifi dongle. It is recommended to use you mower name as Wifi SSID and HusqvarnaHrp2 as password.

You also need to follow the steps from the first comment by changing port to 5353.

It is also recommended to use secondary wifi dongle in your PC if you connect to internet/intranet using wifi.

Your /etc/netplan/50-cloud-init.yaml should look something like this

```
network:
  ethernets:
    eth0:
      dhcp4: true
      optional: true
  wlan1:
    dhcp4: false
    addresses:
      - 192.168.4.1/24
  version: 2
  wifis:
    wlan0:
      access-points:
        NAMEOFACCESSPOINT:
          password: PASSWORDTOACCESSPOINT
      dhcp4: true
      optional: true
```

Your /etc/hostapd/hostapd.conf should look likte this

```
interface=wlan1
driver=nl80211
ssid=YOURMOWERNAME
hw_mode=g
channel=7
wmm_enabled=0
macaddr_acl=0
auth_algs=1
ignore_broadcast_ssid=0
wpa=2
wpa_passphrase=HusqvarnaHrp2
wpa_key_mgmt=WPA-PSK
wpa_pairwise=TKIP
rsn_pairwise=CCMP
```

Boot up speed

If your Raspberry pi suffers from bootup speed problem, try:

```
sudo touch /etc/cloud/cloud-init.disabled
```

This is normally required when using the Raspberry Pi as Wifi access point. It should take less than a minute before the access point wifi shows up.

ROS2 setup

Continue to [Install ROS2 for HRP2](#)