**EDGE AI HARDWARE** > **CPU**

Raspberry Pi 4

The Raspberry Pi 4 is a versatile Linux development board with a quad-core processor running at 1.5GHz, a GPIO header to connect sensors, and the ability to easily add an external microphone or camera - and it's fully supported by Edge Impulse. You'll be able to sample raw data, build models, and deploy trained machine learning models directly from the Studio.

In addition to the Raspberry Pi 4 we recommend that you also add a camera and / or a microphone. Most popular USB webcams and the Camera Module work fine on the development board out of the box.
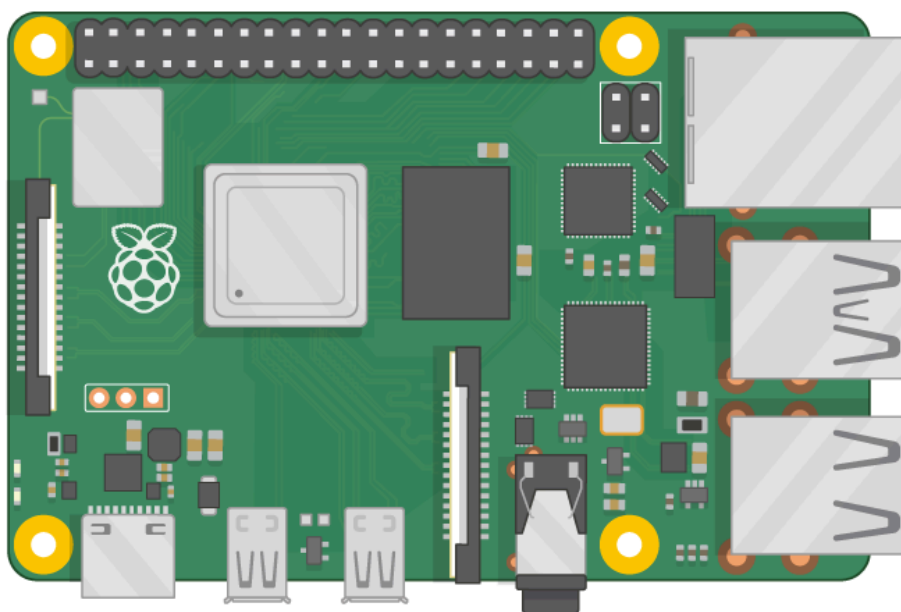
Raspberry Pi 4

Prerequisite

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Accept   Reject

Bookworm and newer releases   Bullseye and older releases

Headless Setup

You can set up your Raspberry Pi without a screen. To do so:

1. Flash the [Raspberry Pi OS](#) image to an SD card using the Raspberry Pi Imager.

   > ⚠ You must use 64-bit OS with **_aarch64** and 32-bit OS with **armv7l_***

2. During the flashing process, access the advanced options menu in the Raspberry Pi Imager to preconfigure your WiFi and enable SSH.

   > ⚠ • wpa_supplicant.conf cannot be used from Bookworm onward. You must use the Pi Imager or the advanced menu `raspi-config` tool to set up WiFi.

3. Insert the SD card into your Raspberry Pi 4, and let the device boot up.

4. Find the IP address of your Raspberry Pi. You can either do this through the DHCP logs in your router or by scanning your network. E.g., on macOS and Linux via:

   ```
   $ arp -na | grep -i dc:a6:32
   ? (192.168.1.19) at dc:a6:32:f5:b6:7e on en0 ifscope [ethern
   ```

   Here `192.168.1.19` is your IP address.

5. Connect to the Raspberry Pi over SSH. Open a terminal window and run:

   ```
   ssh <username>@192.168.1.19
   ```

6. Log in with the default username `pi` and password `raspberry`.

Setup with a Screen

If you have a sc   Pi:

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1. Flash the [Ra

2. Insert the SD card into your Raspberry Pi 4, and let the device boot up.

3. Connect to your WiFi network.

4. Click the 'Terminal' icon in the top bar of the Raspberry Pi.

Installing dependencies

To set this device up in Edge Impulse, run the following commands:

```
sudo apt update
curl -sL https://deb.nodesource.com/setup_20.x | sudo bash -
sudo apt install -y gcc g++ make build-essential nodejs sox gstreame
sudo npm install edge-impulse-linux -g --unsafe-perm
```

> ⚠ **Important:** Edge Impulse requires Node.js version 20.x or later. Using older versions may lead to installation issues or runtime errors. Please ensure you have the correct version installed before proceeding with the setup.

If you have a Raspberry Pi Camera Module, you also need to activate it first. Run the following command:

```
sudo raspi-config
```

Use the cursor keys to select and open Interfacing Options, and then select Camera and follow the prompt to enable the camera. Then reboot the Raspberry.

Install with Docker

If you want to install Edge Impulse on your Raspberry Pi using Docker you can run the following commands:

```
docker run -it
```

Once on the Dock

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```
apt-get update
apt-get install wget -y
wget https://deb.nodesource.com/setup_20.x
bash setup_20.x
apt install -y gcc g++ make build-essential nodejs sox gstreamer1.0-
apt-get install npm -y
npm install edge-impulse-linux -g --unsafe-perm
```

and

```
/lib/systemd/systemd-udevd --daemon
```

You should now be able to run Edge Impulse CLI tools from the container running on your Raspberry.

Note that this will only work using an external USB camera.

Connecting to Edge Impulse

With all software set up, connect your camera or microphone to your Raspberry Pi (see 'Next steps' further on this page if you want to connect a different sensor), and run:
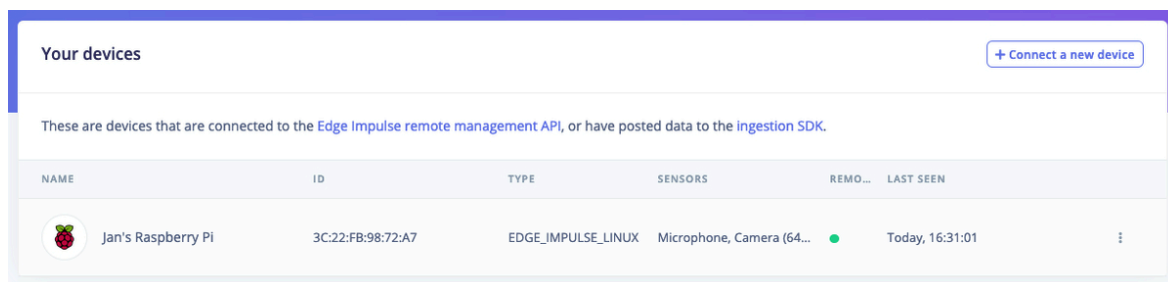
```
edge-impulse-linux
```

This will start a wizard which will ask you to log in, and choose an Edge Impulse project. If you want to switch projects run the command with `--clean`.

Verifying that your device is connected

That's all! Your device is now connected to Edge Impulse. To verify this, go to your Edge Impulse

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Device connected to Edge Impulse.

Next steps: building a machine learning model

With everything set up you can now build your first machine learning model with these tutorials:

- [Keyword spotting](#)
- [Sound recognition](#)
- [Image classification](#)
- [object detection](#).
- [Object detection with centroids (FOMO)](#)

Looking to connect different sensors? Our [Linux SDK](#) lets you easily send data from any sensor and any programming language (with examples in Node.js, Python, Go and C++) into Edge Impulse.

Deploying back to device

To run your impulse locally, just connect to your Raspberry Pi again, and run:

```
edge-impulse-linux-runner
```

This will automatically compile your model with full hardware acceleration, download the model image to your Raspberry Pi, and then start classifying. Our [Linux SDK](#) has examples on how to integrate the model with your favorite programming language.

Image model?

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If you have an image model then you can get a peek of what your device sees by being on the same network as your device, and finding the 'Want to see a feed of the camera and live classification in your browser' message in the console. Open the URL in a browser and both the camera feed and the classification are shown:
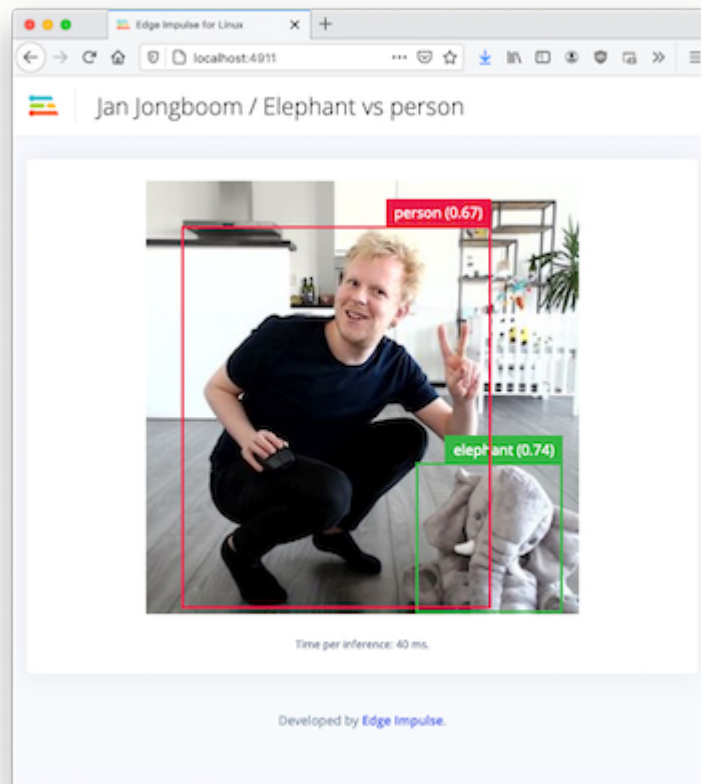
Live feed with classification results

Troubleshooting

Wrong OS bits

If you see the following error when trying to deploy a .eim model to your Raspberry Pi:

Failed to run

It likely means you are attempting to deploy a .eim Edge Impulse model file to a 32-bit operating system running on a 64-bit CPU. To check your hardware architecture and OS in Linux, please run the following commands:

```
uname -m
uname -a
getconf LONG_BIT
```

If you see something like this:

```
$ uname -m
aarch64
$ uname -a
Linux raspberrypi 6.1.21-v8+ #1642 SMP PREEMPT Mon Apr  3 17:24:20 
$ getconf LONG_BIT
32
```

It means that you are running a 32-bit OS on a 64-bit CPU. To run .eim models on *aarch64* CPUs, you *must* use a 64-bit operating system. Please download and install the 64-bit version of Raspberry Pi OS if you see `aarch64` when you run `uname -m`.

Last updated 19 days ago   Was this helpful? ☹ 😐 🙂

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