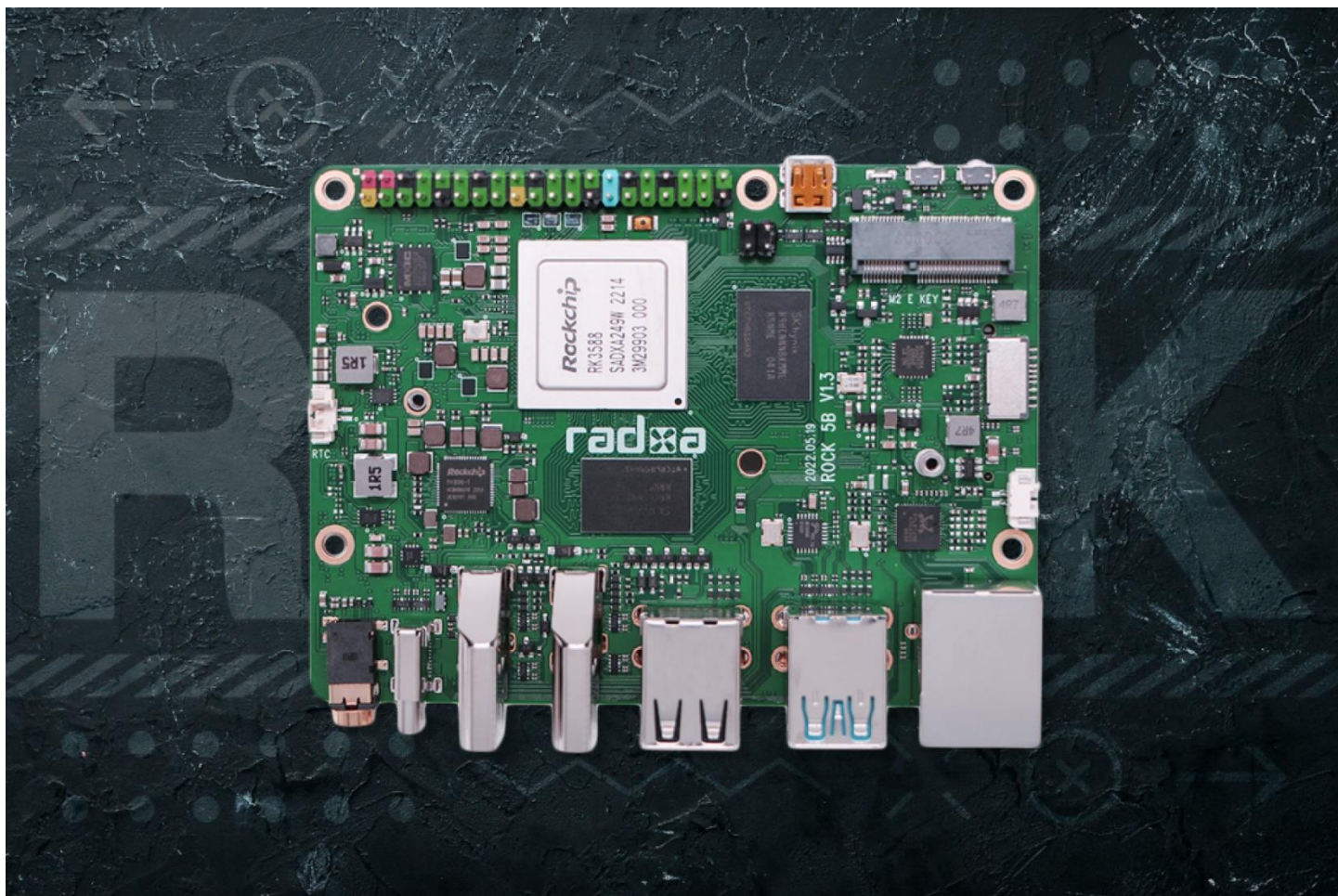**Get started with the next-gen single board computer, ROCK 5B, and learn how to download and install Debian Bullseye (64-bit) onto an SD card and perform the basic system setup. This handy guide will tell you everything you need to know to get started with the ROCK 5B in a few easy steps.**

ROCK 5B is a fast and flexible Single Board Computer (SBC) based on the powerful Rockchip RK3588 SoC, with a 64-bit, 8-core Arm processor, 8MB of RAM and multiple permanent storage options (microSD, eMMC & NVME) with up to 8K HDMI video capabilities, and also a built-in NPU into the SOC running at up to 6TOPs for ML applications.

Android, Debian & Ubuntu Linux operating systems are officially supported along with several other community-built systems.

In this Getting Started, we show how to download and install Debian Bullseye (64-bit) onto an SD card and perform the basic system setup. This will give you a lightweight, dynamic and functional XFCE desktop for general use on your ROCK 5B, from which you can add further Open Source applications to your liking.
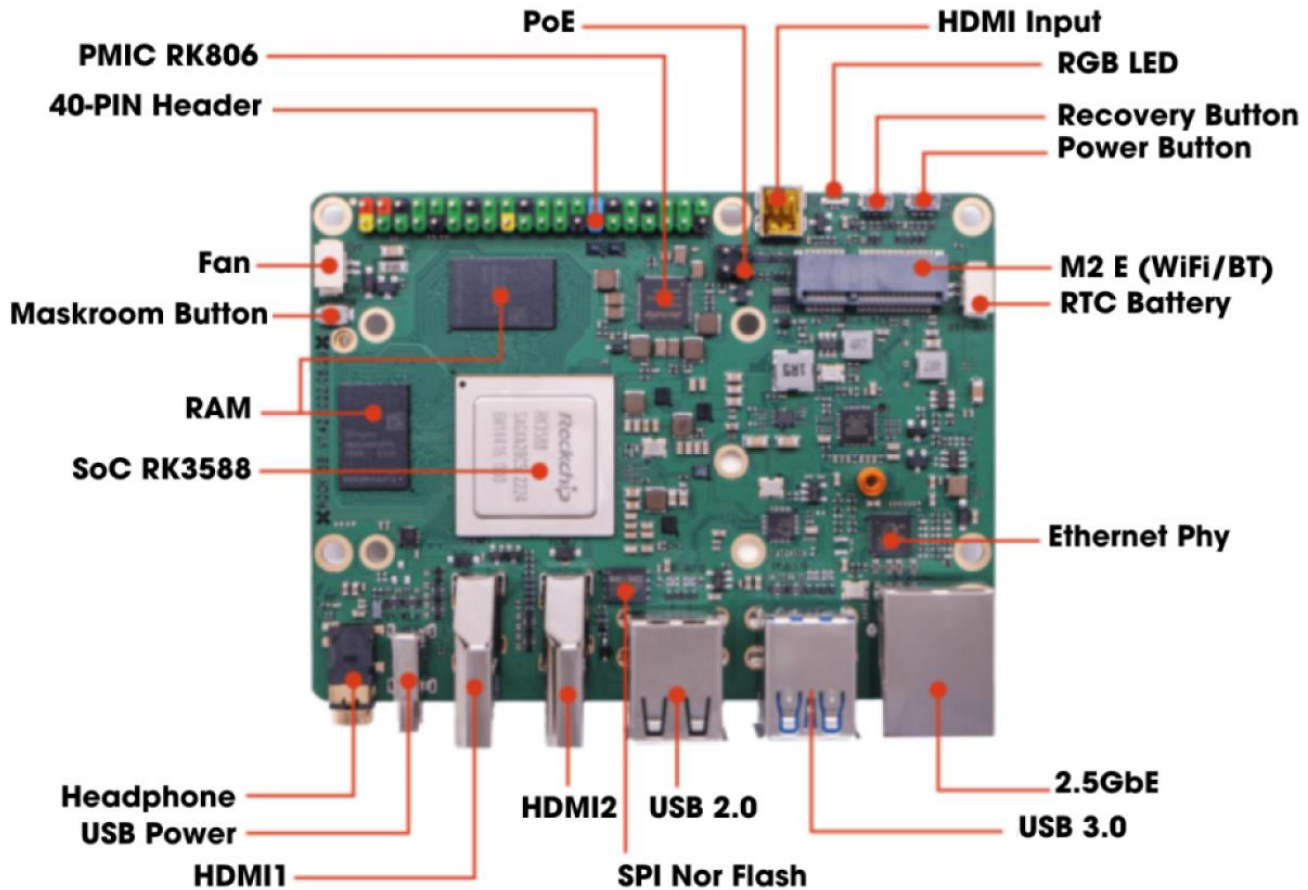
STEP 1: DOWNLOAD OS

Download a copy of the Debian desktop OS for the ROCK 5B. You can do this using either a Windows, Mac or Linux host PC or laptop. Save the image file to somewhere convenient on your storage. We used the Downloads directory on a Windows PC:

- Visit the [Radxa's Wiki](#) and click the **Debian 11 Bullseye** link for the ROCK 5B;

- Allow the image file to download – it is about 900 MB in size;

- The filename will be similar to this depending on the version date (the same image is used for the 4B board); **rock-5b-debian-bullseye-xfce4-arm64-20221031-1558-gpt.img.xz;**

- There is no need to expand the compressed file.

Note: There are several other Linux Operating Systems to choose from on the downloads page. The installation process is similar for all of them.

	• ROCK 5B 🔒	Debian Product. Installation Wiki Debian 11 Bullseye Change Log 🔒.

STEP 2: IMAGING SOFTWARE

An OS image cannot be copied directly to an SD card as you would a normal file or directory. You need special-purpose imaging software to flash the image to the SD card. We recommend the Open Source **balenaEtcher,** which is available on either Windows, Mac or Linux. It also performs some validation checks on the flashed image:

- Visit the download page at **balenaEtcher** and install the version for your host operating system.

STEP 3: FLASH THE SD CARD

Now everything is ready to flash the OS image onto the microSD card. Use a good quality, branded, 32GB card. We use SanDisk Ultra cards which are fast, durable and reliable.

- Insert the SD card into a card reader on your **host PC**;

- Open balenaEtcher and select the OS image you downloaded in **Step 1**;

- Select the **SD card** to flash – be careful to choose the correct one;

- Click the **Flash** button;

- Wait for the imaging and validation process to complete, then **eject** the SD card and remove it from your host PC.

Tip: If your system asks you to format the card at any time, just click cancel.
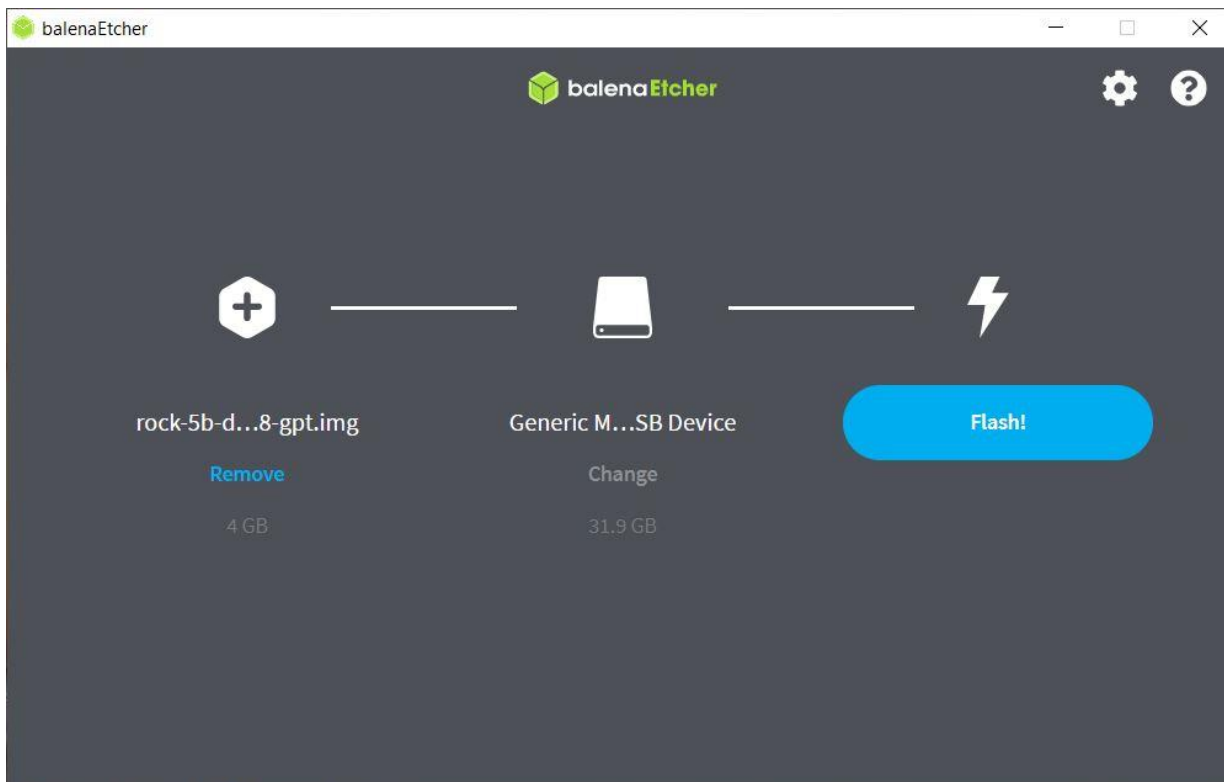
STEP 4: CONNECT THE CABLES

Now that your SD card is prepared, connect up your ROCK 5B:

- Connect a keyboard and mouse to the **USB 2.0** (Black) sockets;

- Attach a full-size **HDMI** cable to the HDMI 1 output and your monitor;

- Connect a **CAT5** Ethernet cable to the Ethernet port and your internet Router / Switch;

- Carefully insert the **SD card** into the card socket with the gold pins on the card facing upwards;

- Connect the power supply to the **USB-C** socket but do not power it yet.
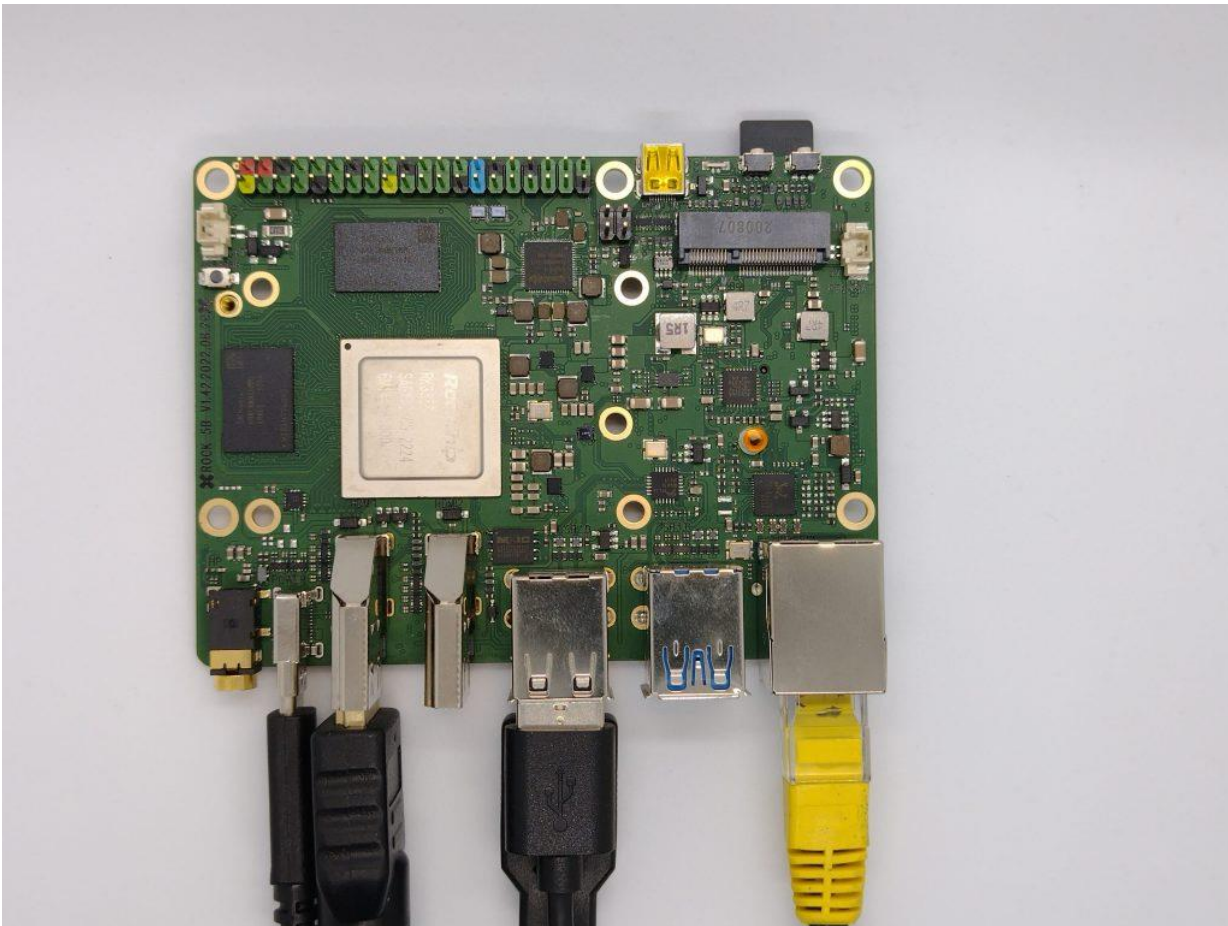
STEP 5: BOOT

Check that everything is prepared as in the steps above, turn on your monitor and plug in the power supply to boot the ROCK 5B:

- The **green** power LED will turn on, and the **blue** activity LED should start blinking after a few seconds.

- The first boot takes about 30 seconds, and the monitor will scroll the boot messages; then, the XFCE Desktop will appear with the login dialogue box.

Log in with the default credentials:

- username: **rock**

- password: **rock**
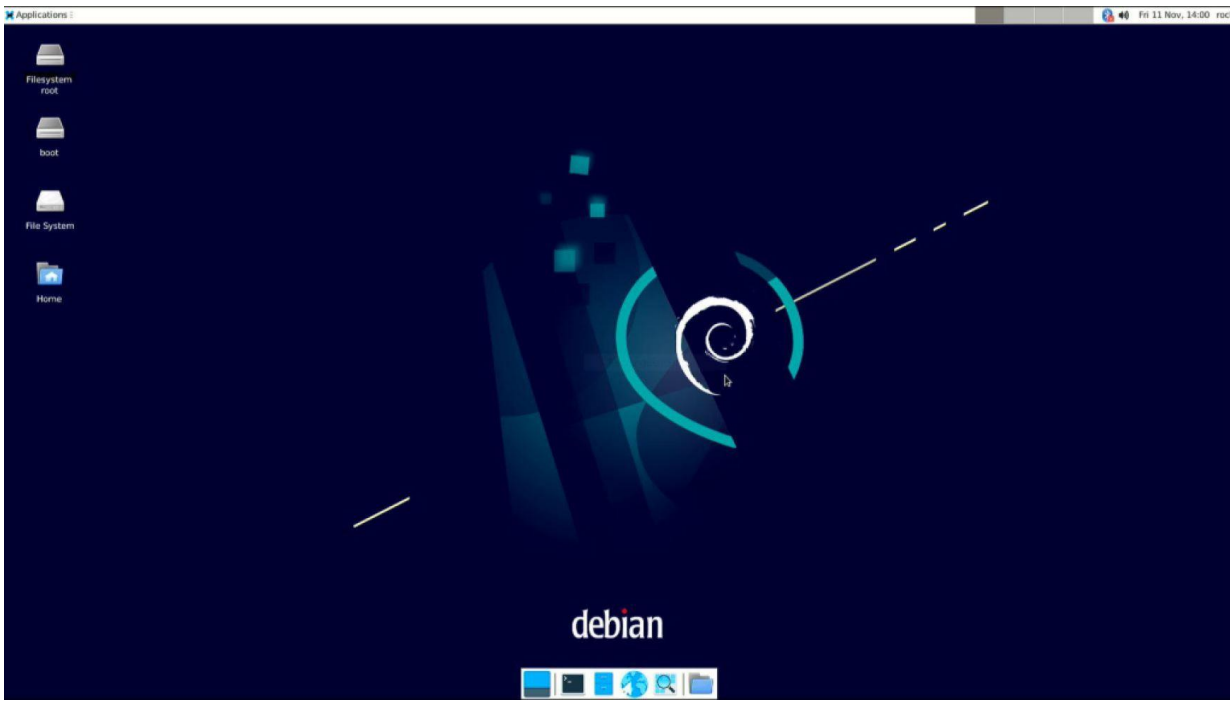
STEP 6: CHANGE THE PASSWORD

Using the Terminal from the menu, change the default password to a more secure one:

- Open **Applications -> Terminal Emulation**;

- Enter the following command at the prompt and follow the instructions to set a new password.

passwd

STEP 7: UPDATE THE SYSTEM

The system and installed software are constantly being updated, so you can pull in these updates with the following commands as a super-user. It is advisable to do this regularly to keep your system secure:

- Open **Applications -> Terminal Emulation**;

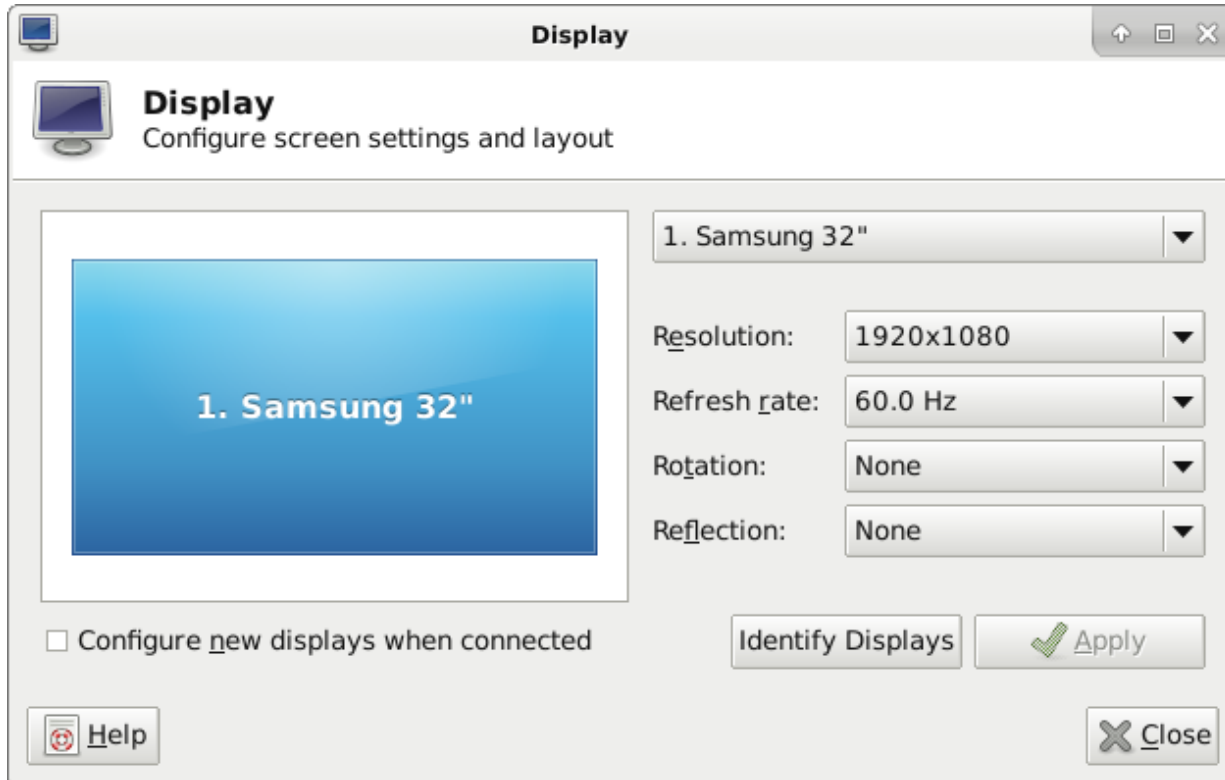- Execute the following commands at the prompt:

sudo apt update

sudo apt upgrade

STEP 8: SET THE DISPLAY (OPTIONAL)

Your HDMI display settings should be recognised automatically. If they need adjusting, you can set them using the Display Manager from the Applications menu:

- Right-click anywhere on the desktop background and select **Applications -> Settings -> Display**;

- Select your monitor **Resolution** and **Refresh rate**;

- Click **Apply**;

- Wait for the display to reset.

STEP 9: SET KEYBOARD (OPTIONAL)

The default keyboard setting is English US. This can be changed using the Terminal:

- Click **Applications -> Terminal Emulator**;

- Run the following command as a super-user (sudo) and follow the prompts to select your keyboard layout:

sudo dpkg-reconfigure keyboard-configuration

The keyboard setting will change after rebooting.
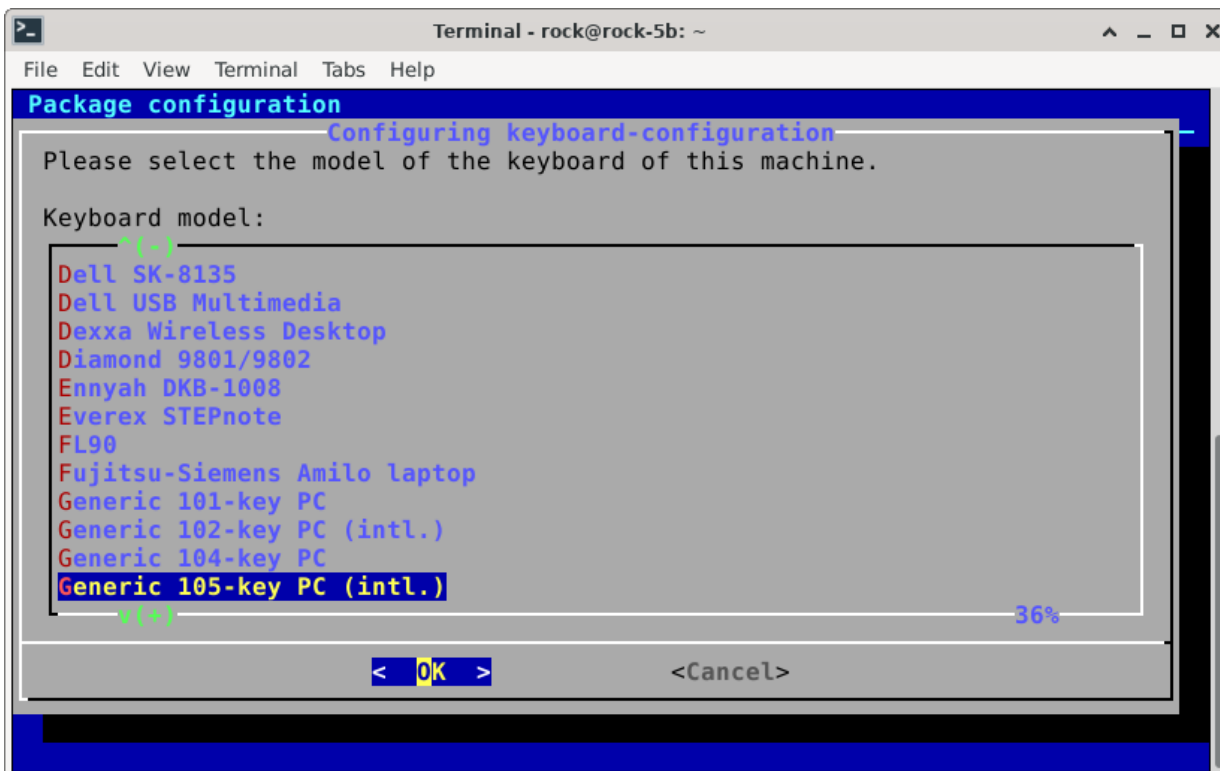
STEP 10: SET THE TIMEZONE (OPTIONAL)

The default time setting is Universal Time (UTC). If you want to use Local Time, you can set this using the **timedatectl** command in Terminal with super-user privileges:

- Open Terminal from the menu, **Applications -> Terminal Emulator**;

- Display a list of available timezones by typing the following command (press the F key to page forward):

timedatectl list-timezones

- Set your local timezone from the list using this command with the example for London, UK:

sudo timedatectl set-timezone Europe/London

- Check the settings with the following command:

timedatectl

Tip: Linux commands are case-sensitive, so follow any capitalisation exactly.

STEP 11: REBOOT

Now that everything is configured how you want, reboot the system from the menu to enable all the settings:

- Click **Applications -> Logout -> Restart**.

Let the system reboot, log back in, and you are ready to go!

STEP 12: HDMI SOUND

If there is no sound when using multimedia applications like Chromium or Firefox, use the Audio control to set the audio channel:

- Open the multimedia application **first**, for example, Firefox, and **play** the media (otherwise, the audio setting will not appear);

- Left-click the **Speaker** icon in the top right of the desktop;

- Click the **Built-in Audio Stereo** option;

- Change the Built-in Audio Stereo source, and the sound should be audible.
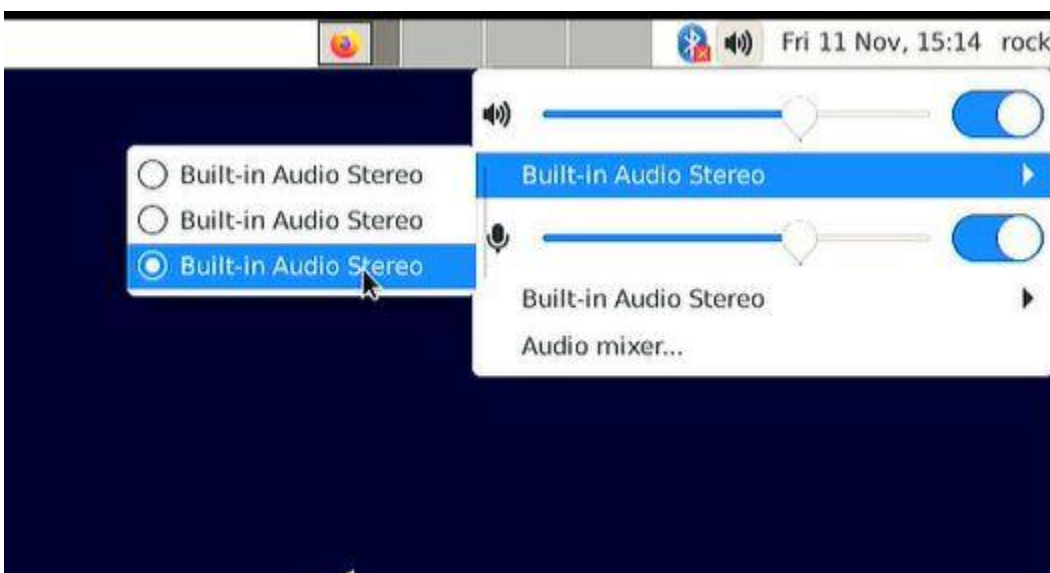
STEP 13: ADDING APPLICATIONS

The Debian package repository (Debian Repo) contains over **50K Open Source** software applications called Packages, most of which will work with the ROCK 5B. [You can search or browse the repo in several ways here.](#)

Once you know the name of the package, it can be installed using Terminal along with any dependencies using the following command as the super-user:

sudo apt install <package name>

Here we are installing TensorFlow, the machine learning and AI application, using the Python package installer:

sudo pip install --upgrade tensorflow

STEP 14: SHUTDOWN

Linux systems should always be shut down properly before removing the power supply to avoid corrupting the SD card. Use the following menu option to perform a safe system shutdown:

- Click **Applications -> Log Out -> Shut Down.**

- Allow a **few seconds** for the blue activity LED to stop flashing. The green power LED will stay on.

- Now, it is safe to **turn off** the power supply.

Tip: If you don't have a monitor attached, you can safely shut down the ROCK 5B with the power button. If the system is off, pressing the power button will start it up.
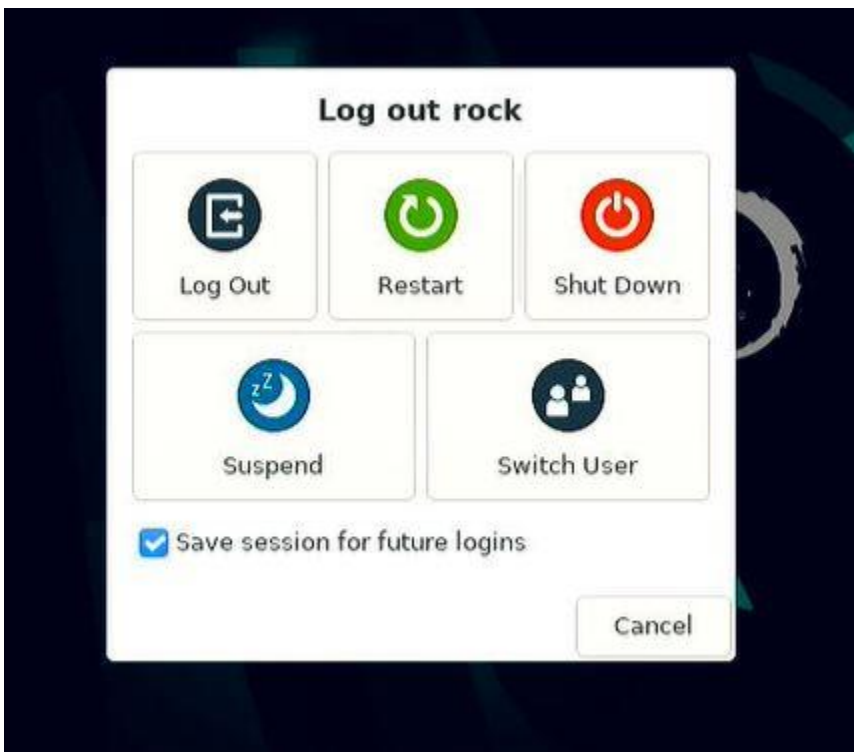
Summary

If you have followed all the steps in this guide, you will have a nicely configured Debian desktop system for your ROCK 5B setup for general use.

This is a very fast and flexible SBC with plenty of options for both extra hardware and software. There are now thousands of Open Source software applications at your fingertips which can be added to your system, from programming environments, Machine Learning & AI, audio and video editing, office applications, scientific software and gaming, so start exploring!