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USER MANUAL

Linux: Indiedroid Nova



ameriDroid
High-Performance Electronics

Table of Contents

What is Linux?	3
Why Should I Learn Linux?	3
Top Linux Statistics	4
Things you will need	5
Setting Up Indiedroid Nova	5
STEP 1: Download Operating System Image for the Nova	5
STEP 1A: If Installing to eMMC, Remove Bottom Heatsink Plate on Nova	7
STEP 2: Flash the Downloaded Operating System to the microSD or eMMC	7
STEP 3: Insert eMMC or microSD Card into the Nova	8
STEP 4: Connecting Accessories	10
STEP 5: Update Linux	11
Appendices	13
Appendix A: Flash your eMMC or microSD with different Operating Systems.	13
STEP 1: Connecting eMMC to your computer	13
STEP 2: Flash eMMC using balenaEtcher	14
Appendix B: Flash your eMMC or microSD Using Rkdevtool	19
STEP 1: Install Driver	19
STEP 2: Install rkdevtool	20
Appendix C: Installing the Fan on top of the Heatsink	22
Appendix D: Interesting Notes About Power Supplies	23
Appendix E: Troubleshooting	25
Appendix F: Additional Resources	28

Important: Be careful and gentle when removing and replacing the EMMC module as the connectors are fragile and can be damaged. This type of wear-and-tear damage is not covered under warranty.

What is Linux?

Just like Windows, Android, iOS, and MacOS, Linux is an operating system. One of the most popular operating systems on the planet, Android, is derived from the Linux operating system as is Chrome OS (Chromebooks) and some of MacOS. Windows now allows running Linux software. Much of the Internet runs on Linux servers and devices.

An operating system is software that manages all of the hardware resources associated with your desktop / laptop / smartphone / router / smart appliance / etc., and provides a framework to allow applications to run. To put it simply, the operating system manages the communication between your software and your hardware. Without the operating system (OS), applications wouldn't function.

Why Should I Learn Linux?

- High security - Linux isn't controlled by any company and due to its open-source nature doesn't have hidden functionality that can create intentional or unintentional security concerns
- Open source - anyone can audit the source code
- High stability
- Runs on almost any hardware
- Most variants are free
 - Community support
 - Hundreds of "distro" choices (variants)
 - Many desktop environments from which to choose that can be selected at will

Top Linux Statistics

- 100% of the top 500 supercomputers run on Linux
(<https://itsfoss.com/linux-runs-top-supercomputers/>)
 - 90% of public cloud workloads are run on Linux
(<https://www.cbtnuggets.com/blog/certifications/open-source/why-linux-runs-90-percent-of-the-public-cloud-workload>)
- Android constitutes more than 70% of the global mobile operating system market share
(<https://gs.statcounter.com/os-market-share/mobile/worldwide>)
- Linux makes up around 3% of the desktop and laptop market share and is increasing
(<https://itsfoss.com/linux-market-share/>)
 - Over 70% of web servers run Linux
(<https://www.systranbox.com/exploring-how-much-of-the-internet-is-powered-by-linux/>)
- 83% of professional developers surveyed agree Linux is the most loved platform for development
(<https://fossbytes.com/linux-is-the-most-popular-loved-platform-among-devs-s-tack-overflow-survey/>)
- There are over 9,500 Linux games on the Steam platform
(<https://www.engadget.com/2019-02-19-linux-gaming-steam-valve-epic-games-store.html>)
- Microsoft Windows now supports Linux and Android systems and software through Windows Subsystems

Things you will need

1. Computer monitor or TV with an HDMI input
2. HDMI to microHDMI Cable (or adapter) or HDMI to USB-C cable
3. A power outlet into which to plug the power adapter
4. A USB Type-A (USB-A) to USB Type-C (USB-C) cable for power (unless the USB-C cable is part of the power supply)
5. USB keyboard and USB mouse
6. Your excitement!

Setting Up Indiedroid Nova

STEP 1: Download Operating System Image for the Nova

We recommend starting with the operating system that we pre-flashed onto the eMMC at ameriDroid. We test each Nova before shipping it to ensure everything is working.

After verifying that your Nova boots with the included operating system image, you may like to try one of the other operating system images on the Indiedroid.us site. We recommend flashing these other operating systems to a microSD or a different eMMC. That makes it easy to get back to the original operating system if you want to by just plugging the original eMMC back in.

To get started, go to a computer with an Internet connection, head over to <http://indiedroid.us/software> and choose the

operating system that you would like to install. For our purposes, we selected **Armbian Gnome Desktop** developed by Indiedroid community member, *slaminger*.

HOME SPECIFICATIONS DOWNLOADS CREDITS		
ARMBIAN	DEFAULT CREDENTIALS	DEVELOPERS
 Cinnamon Desktop	user: root pass: 1234	lanefu stvhay and others
 Gnome Desktop	user: root pass: 1234	lanefu stvhay and others
 Gnome Desktop	user: root pass: root	slaminger and others
 XFCE Desktop	user: root pass: 1234	lanefu stvhay and others
 Minimal		stvhay

We recommend flashing to eMMC if at all possible. eMMC is much faster and more reliable when compared to microSD cards. However, microSD cards are generally cheaper and are easier to find as many consumer devices like phones, digital cameras, dashcams, etc. use them.

If you’re flashing to microSD, use one of the below methods:

- Look for a microSD slot on the computer and use that
- Look for a full-sized SD slot on the computer and use an SD to microSD adapter like this:
<https://ameridroid.com/products/microsd-to-sd-adapter>
- Use a USB to microSD adapter like this:
<https://ameridroid.com/products/transcend-usb3-0-microsd-adapter>

STEP 1A: If Installing to eMMC, Remove Bottom Heatsink Plate on Nova

Using a screwdriver, remove all 4 screws from the bottom plate. This will allow you to remove the plate and have access to the eMMC port.

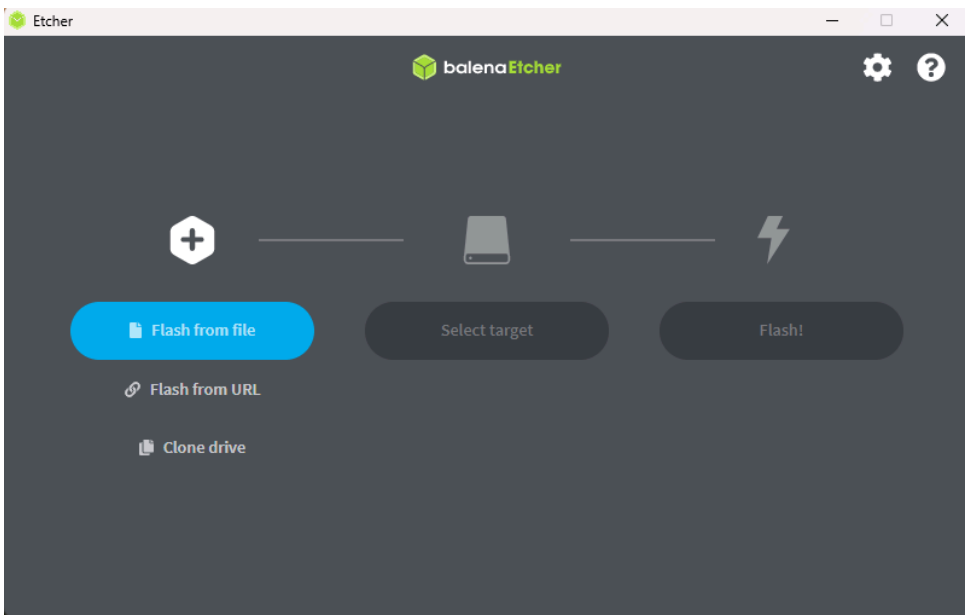
If you're flashing to eMMC, you'll need a USB to eMMC writer, or you can use any of the above microSD methods along with this adapter: <https://ameridroid.com/products/emmc-adapter>

NOTE: There is also a way to flash to the Nova using a USB-C cable from your PC, but this requires the Rockchip flashing tool which is a little more complicated. Instructions for writing an image using this method can be found online.

STEP 2: Flash the Downloaded Operating System to the microSD or eMMC

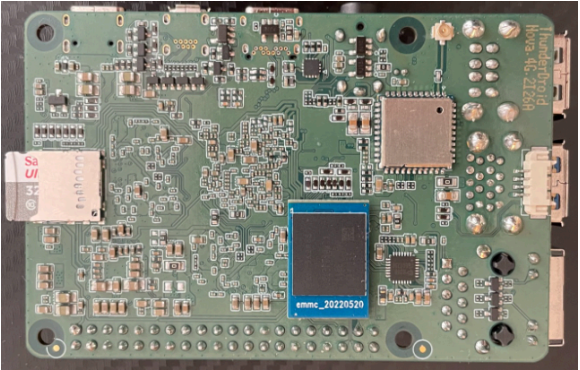
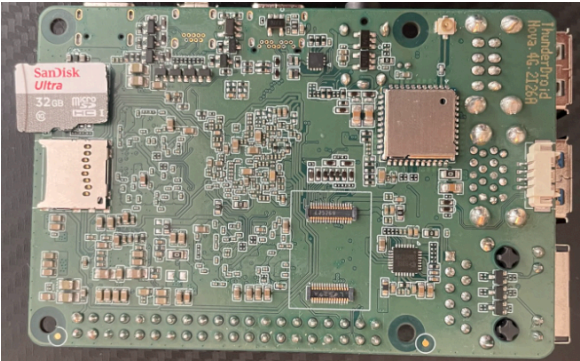
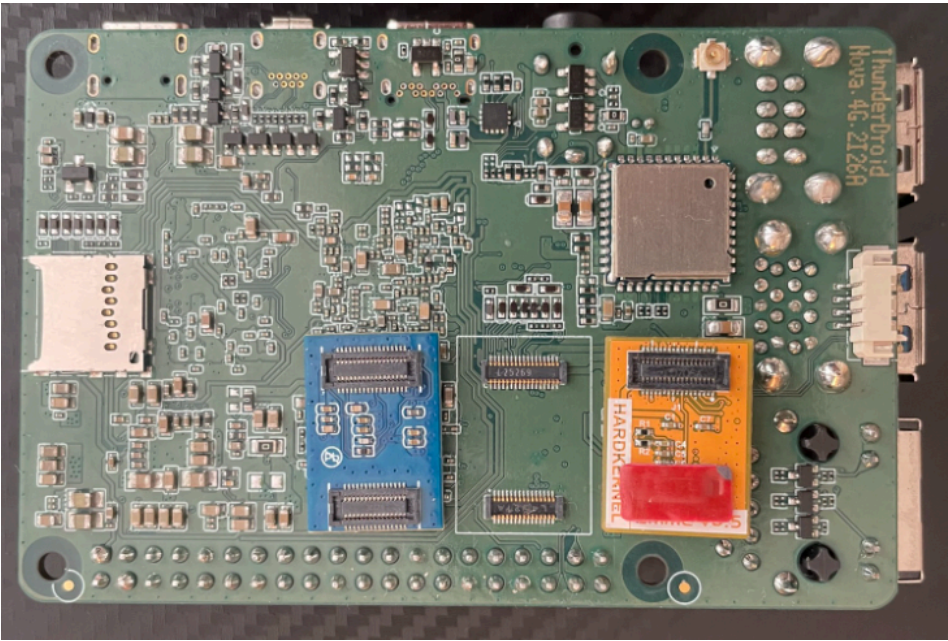
Once you have downloaded the image, open the flashing software and choose "flash from file". We recommend using *balenaEtcher* for this. Navigate to the downloaded image (usually in the logged-in user's **Downloads** directory) and select it. Next, select your desired storage location (eMMC or microSD card) by clicking "select target". Finally, click "flash" to start the flashing process.

NOTE: See Appendix A in this guide for additional information on flashing microSD/eMMC cards.



STEP 3: Insert eMMC or microSD Card into the Nova

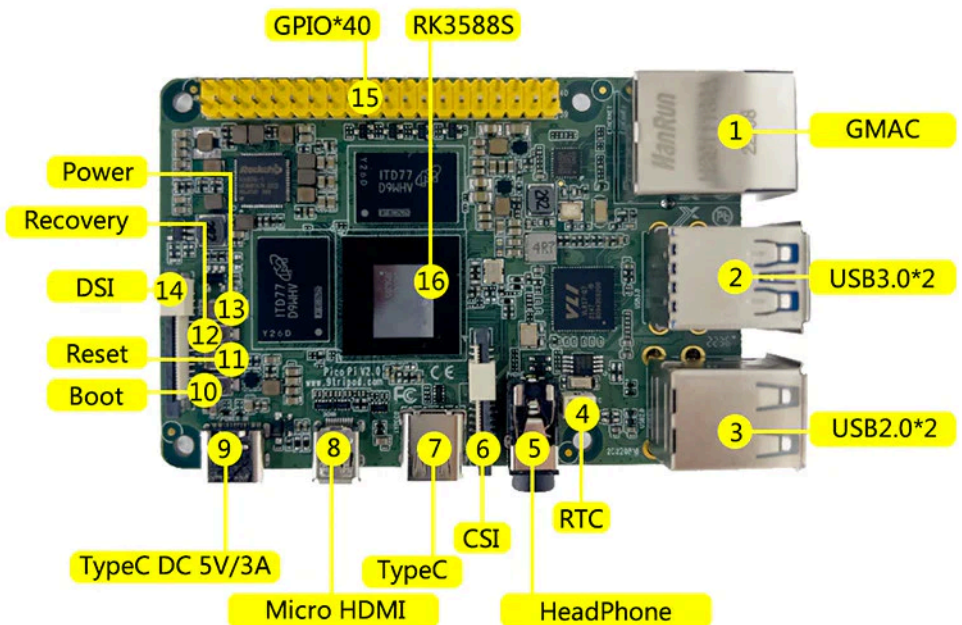
The image below shows the bottom side of two different types of removable eMMC boards that are compatible with the Nova, along with the connectors for the eMMC on the Nova. Flip the eMMC over so the eMMC connector(s) are aligned with the connectors on the Nova and push until it clicks. The second connector on some eMMCs is just to hold the eMMC on the Nova more securely and doesn't actually transmit any data or power between the eMMC and the Nova.



For the microSD card slide it into the microSD card slot as shown on the 2nd and 3rd images on the previous page. It is possible to have the eMMC and microSD card both available on the Nova at the same time.

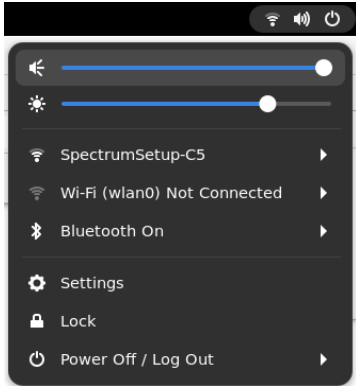
STEP 4: Connecting Accessories

For the final steps:



- Connect the microHDMI or USB-C cable to the microHDMI (8) or USB-C (7) port on the Nova and the other end to the HDMI port in your monitor.
- Connect a mouse and keyboard to the USB Ports (2, 3) to navigate on the OS.

- Connect the Power Supply to the USB-C (9) DC 5V/3A port.
- Enjoy Linux on your hand-size computer.



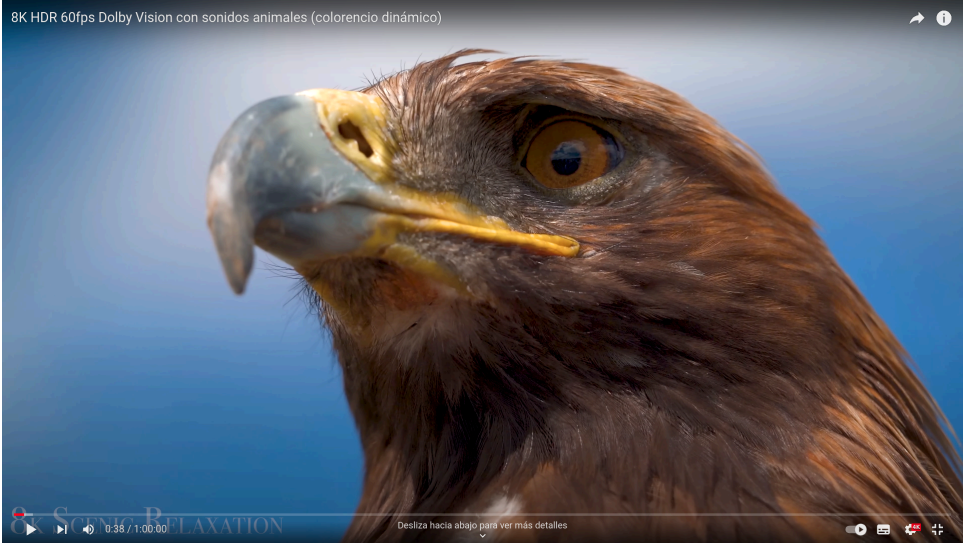
STEP 5: Update Linux

After the first boot, it is always a good idea to update Linux. Connect to a WiFi network (using the WiFi icon in the taskbar) or plug in an Ethernet cable connected to your network. Press the 3 keys **CTRL+ALT+T** to open the terminal, or simply look for **terminal** in the search bar

Next, use these following commands:

```
ttt@indiedroid-nova: ~
ttt@indiedroid-nova:~$ sudo apt update
[sudo] password for ttt:
Hit:1 http://ports.ubuntu.com jammy InRelease
Get:3 http://ports.ubuntu.com jammy-security InRelease [110 kB]
Hit:4 https://ppa.launchpadcontent.net/libretro/stable/ubuntu jammy InRelease
Get:5 http://ports.ubuntu.com jammy-updates InRelease [119 kB]
Hit:6 https://ppa.launchpadcontent.net/liujianfeng1994/panfork-mesa/ubuntu jammy InRelease
Get:2 http://mirror.albony.xyz/armbian jammy InRelease [52.4 kB]
Get:7 http://ports.ubuntu.com jammy-backports InRelease [108 kB]
Hit:8 http://ports.ubuntu.com/ubuntu-ports jammy InRelease
Get:9 https://ppa.launchpadcontent.net/liujianfeng1994/rockchip-multimedia/ubuntu jammy InRelease [18.1 kB]
Get:10 http://ports.ubuntu.com jammy-security/main Sources [210 kB]
Get:11 http://ports.ubuntu.com jammy-security/universe Sources [162 kB]
Get:12 http://ports.ubuntu.com jammy-security/restricted Sources [37.9 kB]
Get:13 http://ports.ubuntu.com jammy-security/multiverse Sources [9,052 B]
Get:14 http://ports.ubuntu.com jammy-security/main arm64 Packages [792 kB]
Get:15 http://ports.ubuntu.com jammy-security/main armhf Packages [503 kB]
Get:16 http://ports.ubuntu.com jammy-security armhf Contents (deb) [33.8 MB]
Get:17 http://mirror.albony.xyz/armbian jammy/jammy-utils armhf Packages [51.8 kB]
Get:18 https://ppa.launchpadcontent.net/liujianfeng1994/rockchip-multimedia/ubuntu jammy/main armhf Packages [12.3 kB]
```

- `sudo apt update`
- `sudo apt upgrade`
- `sudo apt dist-upgrade`
- `sudo reboot`

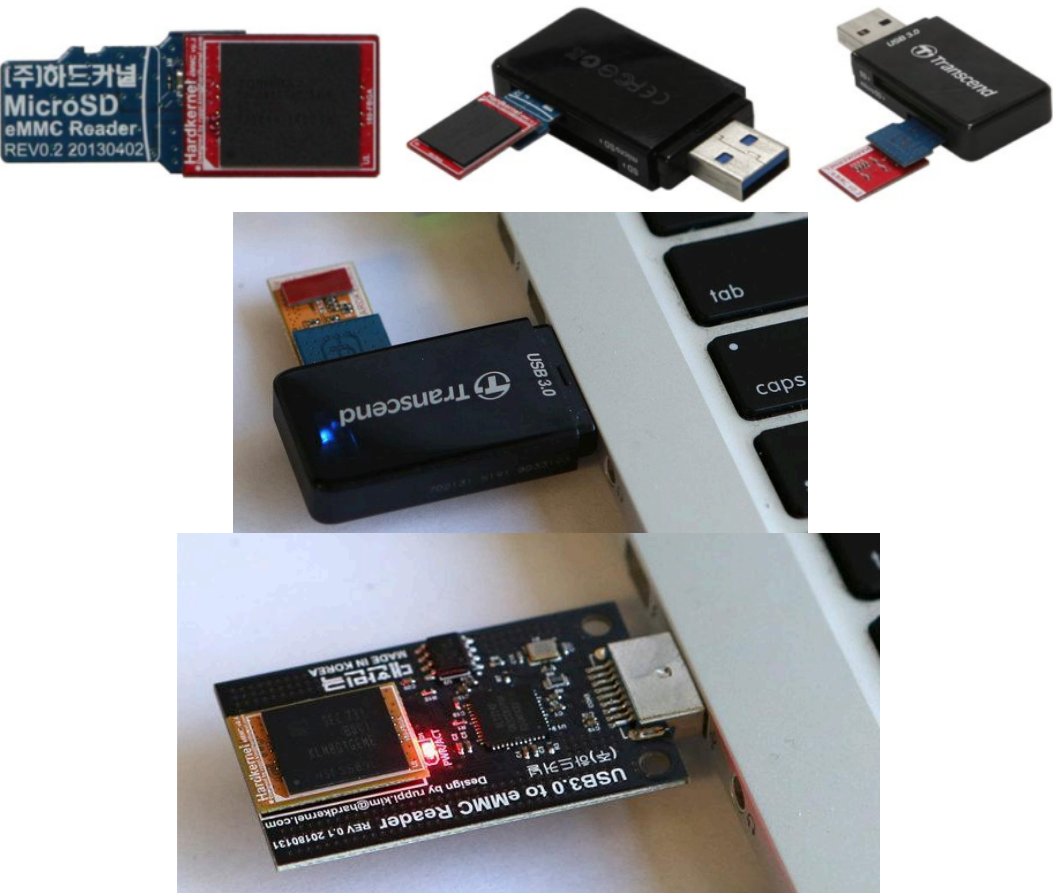


Appendices

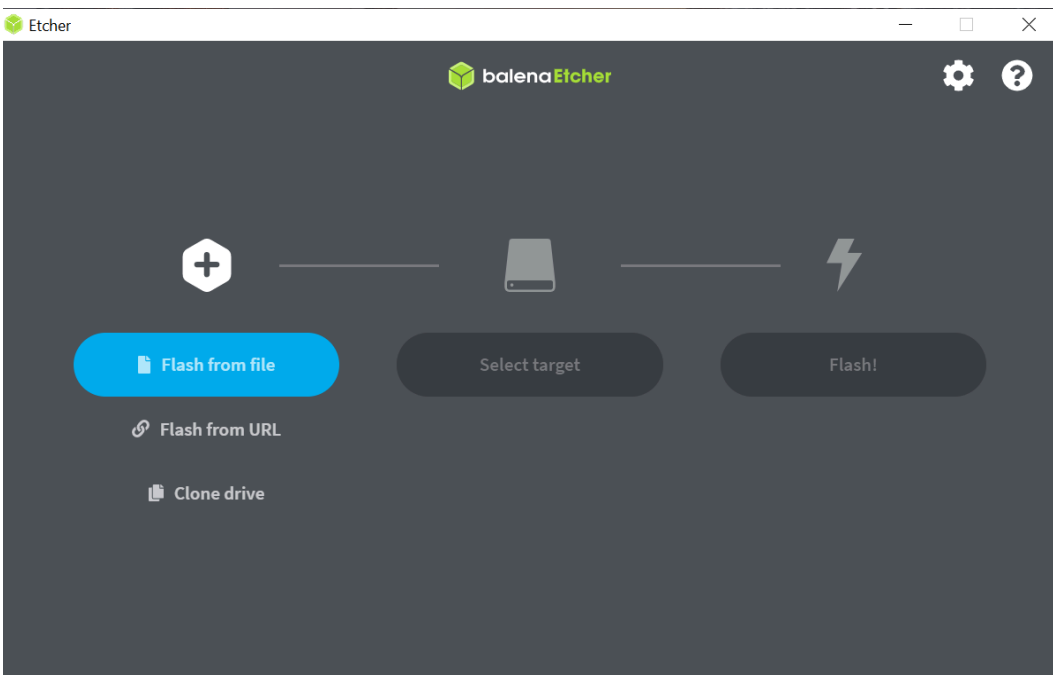
Appendix A: Flash your eMMC or microSD with different Operating Systems.

STEP 1: Connecting eMMC to your computer

You can connect your eMMC to your computer using adapters like shown in the pictures below.

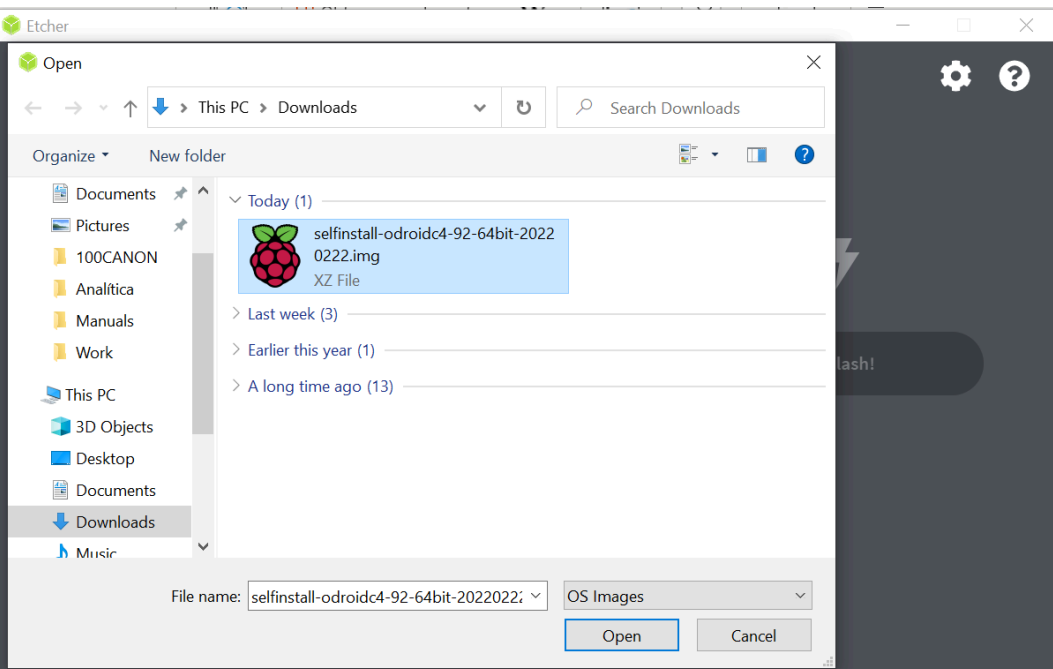


STEP 2: Flash eMMC using balenaEtcher



First, download balenaEtcher from <https://www.balena.io/etcher/>. Next, download the image of the desired operating system from <http://indiedroid.us/software>

Now, run balenaEtcher and select the “Flash from file” option and find the operating system file that was just downloaded.



Next, click “Target” and select the eMMC Module, microSD card or “Compute Module”.

Select target 2 found

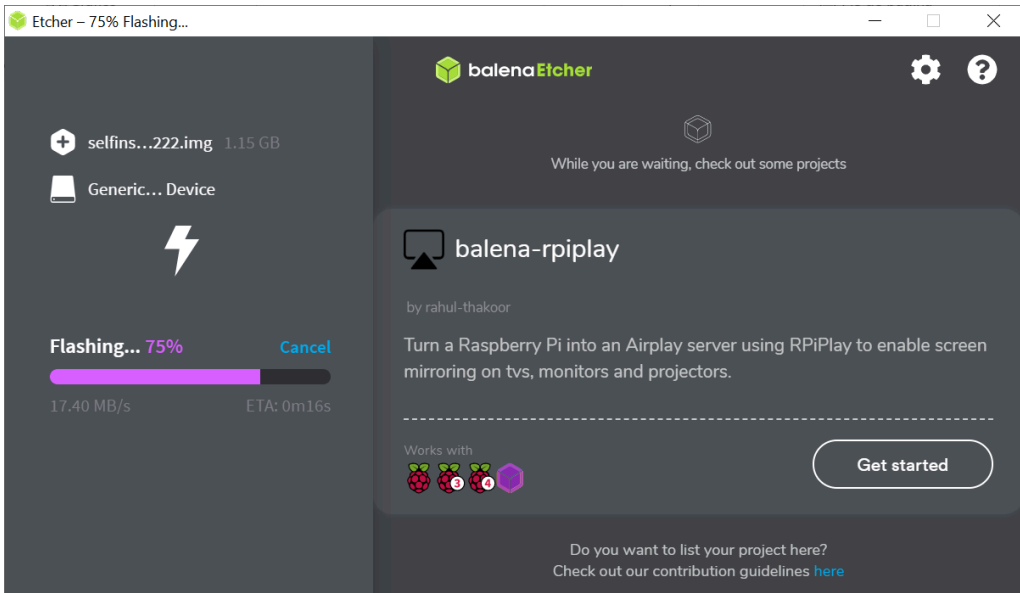
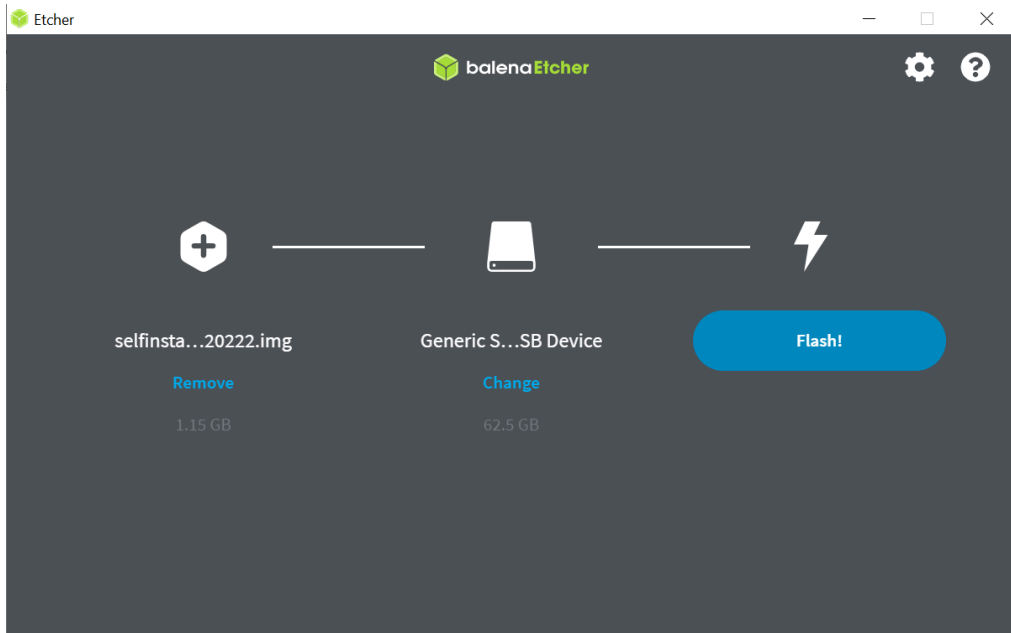
☒	Name	Size	Location
☒	Generic STORAGE DEVICE USB Device	62.5 GB	D:\, E:\

[▼ Show 1 hidden](#)

Cancel

Select (1)

Once the correct target is selected, click “Flash!”

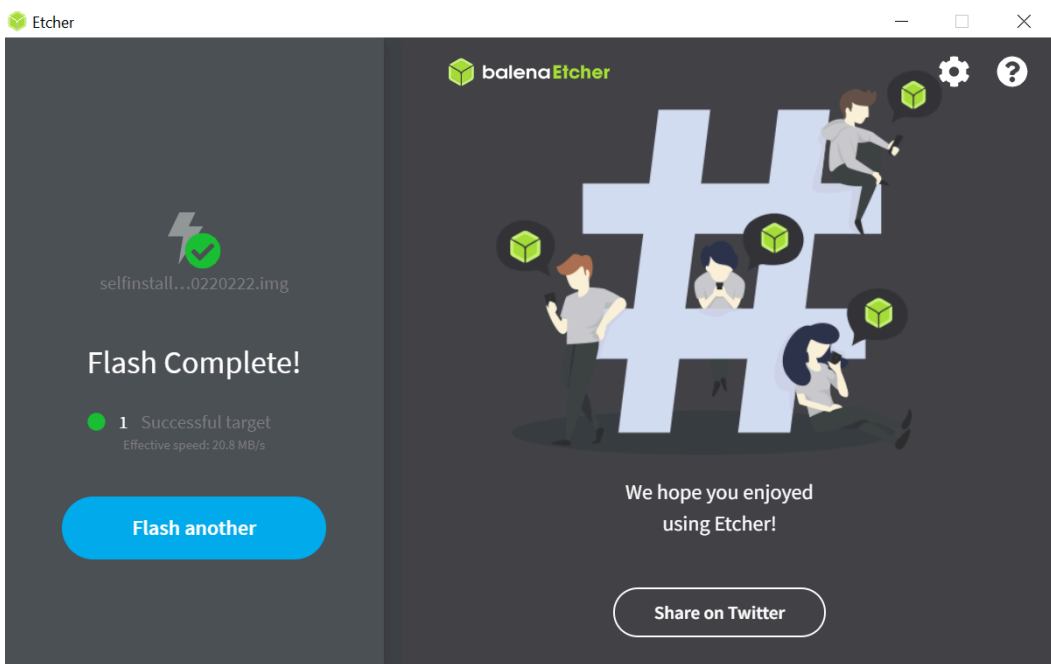


Wait while it flashes.

Apr 10, 2023

17

And it is done!

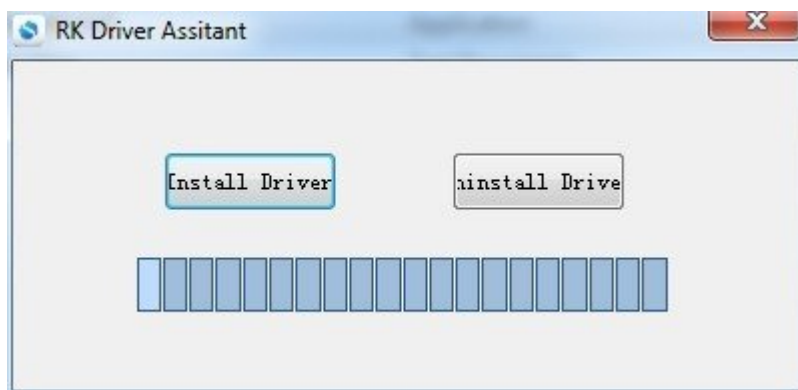


NOTE: We have a bunch of great written and video tutorials on ameriDroid.com about flashing eMMC modules and microSD cards. For instance, type “Flash eMMC” or “Write Image” in the search bar of ameriDroid.com and look at the articles that appear under the product images or under the “Pages & Posts” link.

Appendix B: Flash your eMMC or microSD Using Rkdevtool

STEP 1: Install Driver

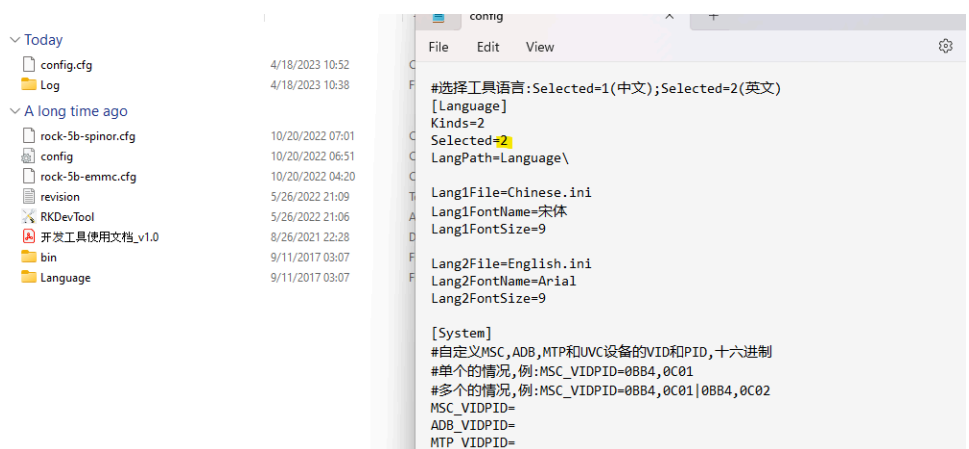
Download the Driver for Windows from https://dl.radxa.com/tools/windows/DriverAssitant_v5.0.zip, unzip the folder, run the RK Driver Assistant and hit Install Driver. Reboot your computer.



STEP 2: Install rkdevtool

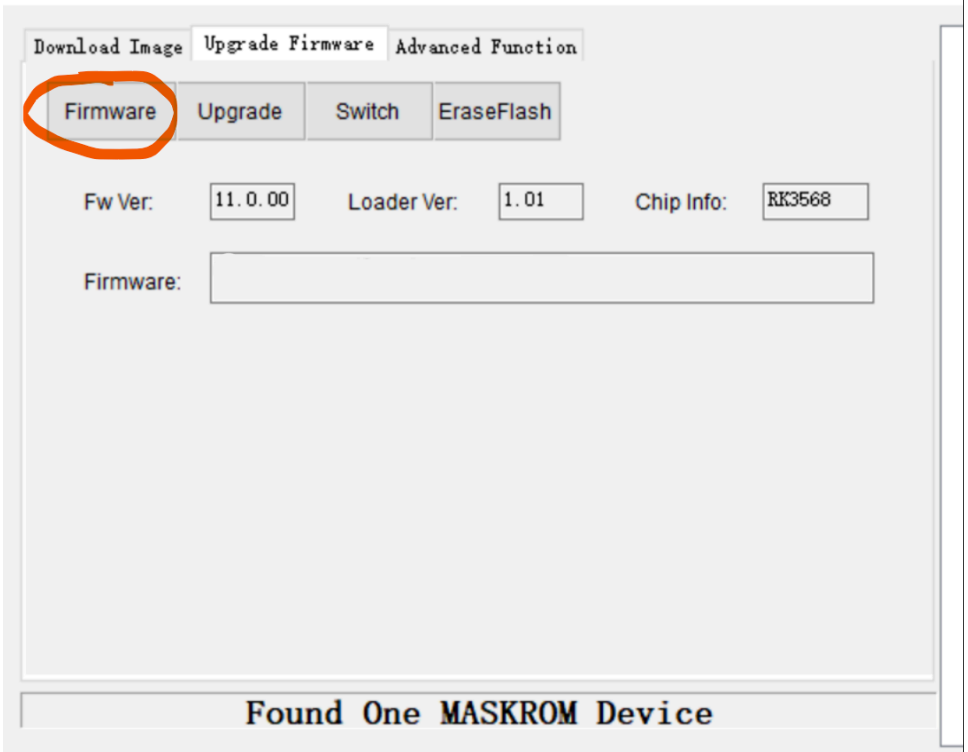
Download the compressed folder

https://dl.radxa.com/tools/windows/RKDevTool_Release_v2.9-6-20221121.rar, unzip it, and open config.ini. Then, change the value of "selected" to 2 to switch the language of the tool to English. After that, connect your Indiedroid Nova to your computer or laptop using a USB-C to USB-A cable, making sure to connect the USB-C end to the display USB-C port (the one right next to the Audio port) and then connect another USB-C cable to the power port on the board. Finally, open the RKDevTool, which should automatically detect your device, if your device is not automatically detected please press the button Boot and Reset at the same time. If that does not work, disconnect the USB-C from the power, press both Boot and Reset, connect the USB-C power and let go of Reset, keep Boot pressed for a few seconds. You can then use the tool to flash any images as needed. Keep in mind that if you have both eMMC and microSD connected, the board will boot from microSD first.



After your device is detected as a MASKROM Device, go to the “Upgrade Firmware” Tab, click firmware and search for the file that you want to flash, then click upgrade.

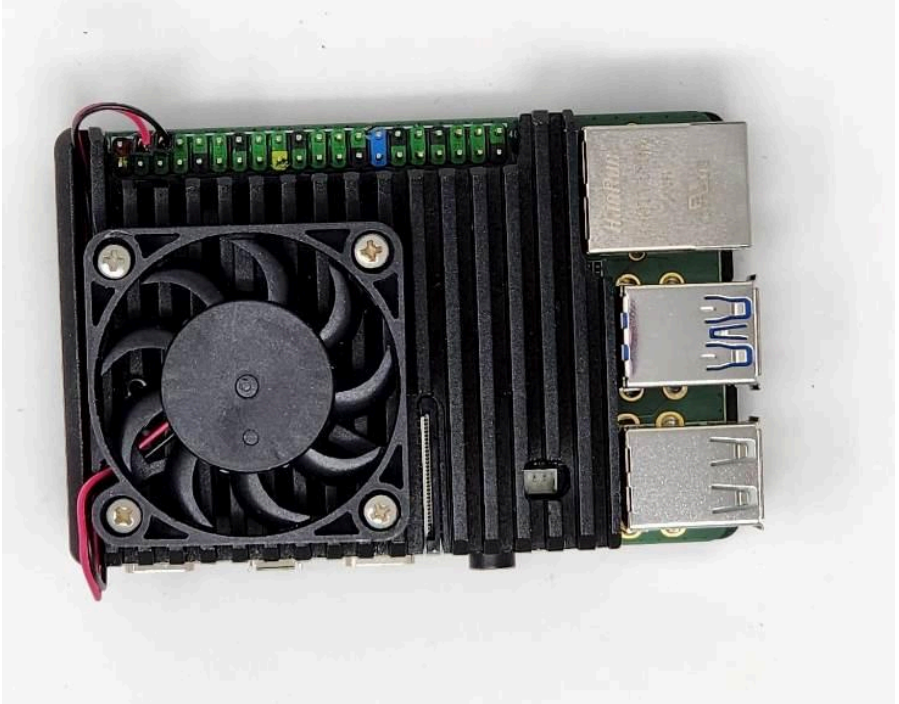
 RKDevTool v2.81



The screenshot shows the RKDevTool v2.81 interface. At the top, there are three tabs: "Download Image", "Upgrade Firmware", and "Advanced Function". The "Upgrade Firmware" tab is selected. Below the tabs, there are four buttons: "Firmware", "Upgrade", "Switch", and "EraseFlash". The "Firmware" button is circled in orange. Below these buttons, there are three input fields: "Fw Ver:" with the value "11.0.00", "Loader Ver:" with the value "1.01", and "Chip Info:" with the value "RK3568". Below these fields is a large empty text box labeled "Firmware:". At the bottom of the interface, a status bar displays the text "Found One MASKROM Device".

Appendix C: Installing the Fan on top of the Heatsink

You can mount the fan on top of the heatsink, even if it doesn't have any specific screw holes threaded into the heatsink. The fins on the heatsink are spaced so that good quality M2.5



metric screws of at least 7mm in length will cut their own threads. The fins are spaced perfectly for fans with mounting holes spaced on 5mm centers, such as 30, 35 or 40mm. Simply line the screw holes on the heatsink with the fins, and using a quality screwdriver with the correct-sized tip for the screws being used, securely screw the screws in place.

Appendix D: Interesting Notes About Power Supplies

Did you know that almost all electronic devices are designed to work with a specific voltage (V), or range of voltages? It's easiest to use the power supply recommended by the manufacturer. However, in some cases it may be necessary to find a different power supply.

- If the device has a USB Type-C (USB-C) port for power, make sure you know the voltage that the device is designed for. For instance, the **Indiedroid Nova is designed for 5V. It usually won't work if you try to plug the Nova into a USB-C power port** - plug it into a USB Type-A power port instead.
- When deciding whether or not to connect a power supply to a device, check to make sure the voltage (V) of the power supply is in the range required by the device, not more or less.
- Check the amperage (A) of the power supply. Make sure the power supply amperage is equal to or greater than the amperage requirements specified by the device.
- If the amperage is listed in **mA**, simply move the decimal three digits to the left to find out how much it is in amps. For instance, 1500mA = 1500.0mA = 1.5A. Again, this number should be equal to or greater than the amperage the device calls for.
- In some cases, it is possible for the device to draw more power than what is specified under "normal" operation. For instance, if a USB device is connected that draws a

lot of power, like an external hard drive, it can require more power from the device than is stated for “normal” operation.

- These reasons (and others) are why we recommend particular power supplies for each device.

Appendix E: Troubleshooting

NOTICE

All Indiedroid Nova boards are assembled and tested at our warehouse in Northern California by our technicians, and are confirmed stable and operational before shipping.

If you have an issue with your Nova, the problem has a high probability of being with one of the peripheral items attached to the Nova.

Here are some things to check:

NO RED LED ON BOARD CLOSE TO USB-C POWER PORT

- Make sure you are using an USB-A to USB-C Cable that delivers the right power to the board. Most power delivery devices that use USB-C to USB-C cables try to use USB PD (power negotiation), which won't work on the Nova.
- Make sure the USB-C end of the power cable is inserted into the USB-C port near the opposite end of the board from the full-sized USB ports. There should be four small buttons close to the correct USB-C port.

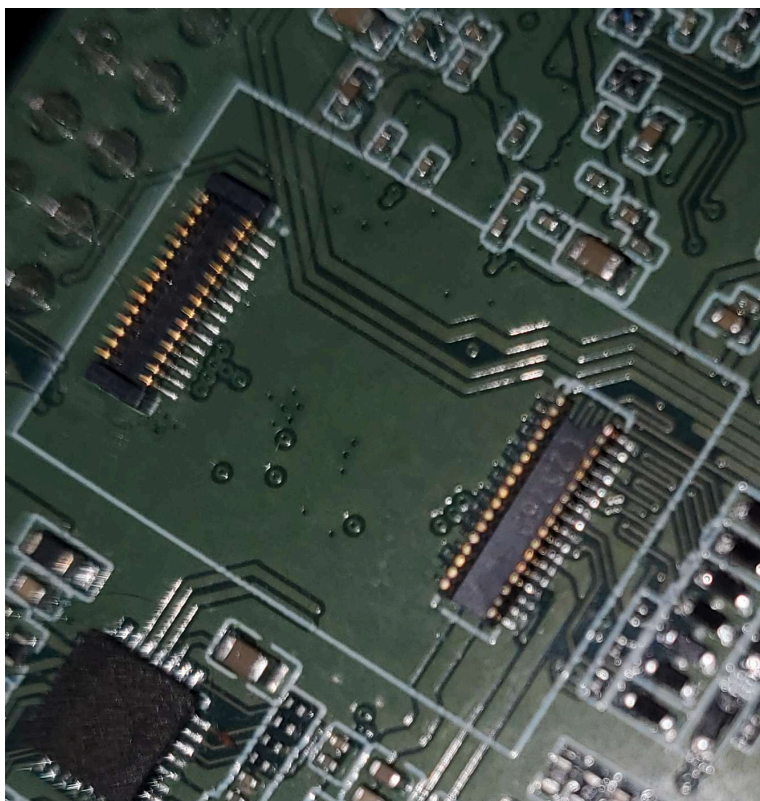
NO VIDEO, BUT RED LED IS ON

- Check that the eMMC or microSD card is properly inserted on its respective port/slot. Try removing the eMMC and snapping it back into place.

- Try using only an eMMC or an microSD card, not both at the same time.
- If the board is not booting, go to <http://indiedroid.us/software> and download the “Recommended” operating system and flash it to your boot media (microSD or eMMC), to make sure the issue is not with the image.
- If you are still getting no signal, try using a different microHDMI to HDMI or USB-C to HDMI cable. Make sure the cable is fully inserted into the appropriate socket.
- Some operating systems may not be configured to use the USB-C to HDMI cable by default, so try a microHDMI to HDMI cable instead.

NOVA WON'T BOOT FROM EMMC BUT BOOTS FROM MICROSD

- The eMMC may not have a valid OS image for the Nova on it. Try reflashing with the recommended image from <https://indiedroid.us/software>
- Some operating systems work only on eMMC, and some work only on microSD. Ask the community on one of the support channels (<https://forum.ameridroid.com> or <https://discord.gg/48vSn7z3K5>)
- The eMMC connector may be damaged which is preventing the eMMC from lining up correctly with the data pins. The picture below shows an example of this damage:



The connector on the left is undamaged, but the connector on the right is missing the side pieces from the eMMC socket

NOVA WON'T BOOT FROM MICROSD

- The microSD may not have a valid OS image for the Nova on it. Try reflashing with the recommended image from <https://indiedroid.us/software>
- Some operating systems work only on eMMC, and some work only on microSD. Try a different OS image. Ask the community on one of the support channels

(<https://forum.ameridroid.com> or
<https://discord.gg/48vSn7z3K5>)

NOVA REBOOTS INSTEAD OF SHUTTING DOWN

- This is a known issue in some Linux kernels. We are hoping this is corrected in a future update. Use **sudo halt** from the terminal for now.

Appendix F: Additional Resources

- ameriDroid Forum - <https://forum.ameridroid.com>
- Indiedroid Wiki - <http://wiki.indiedroid.us>
- Indiedroid Discord - <https://discord.gg/tdWrTy4AW3>