**Word Count: 1413**

Video, Essential Accessories & Setting up the Hardware

In this video, we will take a look at the essential accessories we will need and why we need them for the Raspberry Pi 4. Finally, we will learn to set up the hardware for boot up.

The Raspberry Pi 4 has been designed with the user in mind. It is quick and easy to set up & use. Like any computer, it relies on various external components called peripherals for input and output of the system. Now, we will take a look at some essential accessories you will need to work with the Raspberry Pi.

First & foremost, we need to provide the Pi 4 with clean and reliable power. For that, you will need a 5 Volt power supply rated at 3 Amps with a USB Type C connector. If your power supply doesn't have a USB Types C Connector, you can always use an adapter or a separate cable. If you are buying a cable, make sure that it's not “e-marked” as explained in the last video. Don't come crying to me if you burn your Pi 4 because you used cheap power supply. It’s always a good idea to buy a good branded power supply, or better, you can buy the official raspberry pi power supply.

The next most important accessory you need to buy is a microSD card. This is the storage place of your Pi where the OS and all your files reside. See, here is the thing, usually flash memory like cheap microSD cards are not meant for frequent writes and reads. They are intended for mass storage for media and not for an OS. So you need to be very careful not to go cheap on this. There are two aspects that you have to consider when buying a micro SD card for the Pi 4. One is the storage space, and the other is the read & write speed. Even Though many sites claim that you can install the OS on 8 GB & 16 GB SD cards, we have found that with real-life use, you will need a minimum of 16 GB. We recommend a 32 GB one for people who are very serious about the Pi. Now let's look at the next critical criteria when selecting the micro SD Card. It doesn't matter even if you have a 256GB micro sd card if its slow. Your user experience will suffer, and you will get annoyed. Thus, we recommend you to buy the fastest micro SD card available. This is known as Class 10 microSD card. Therefore we advise you to buy a 32 GB Class 10 micro SD card.

Next, you will need a pair of micro HDMI to HDMI cables, so that you can connect the Pi 4 to up to 2 displays at the same time. Please make sure that you buy a micro HDMI and not a mini HDMI cable. If you have a monitor without an HDMI input socket, you will also need to buy micro HDMI to VGA Convertor. For some odd reason, if you need to connect a very old TV for maybe a like a Retro Gaming Arcade Project, you will need a micro HDMI to RCA composite converter. Obviously, like any computer, you will need a keyboard and a mouse. The keyboard and mouse can be connected directly to the USB ports of the Pi.

In the next section, I will teach you how to work with the Raspberry Pi remotely from your laptop without a display, a keyboard, or a mouse. See, if you have to connect a keyboard and a mouse, please make sure you connect it to the USB 2.0 ports. The Faster USB 3.0 port can be left free to connect other high data throughput devices like an SSD.

The final essential accessory you will need is a raspberry pi 4 case with a fan & heatsinks. Although the Pi foundation claims that the Pi 4 is safe to use without a case, provided that you don’t place it on a metal surface or work with wet hands, we don’t want to take any chances right?! Also, we have seen the Pi 4 heat up by a lot when working with quite a load. We have seen temperatures of the CPU rise well above 85 degree Celsius or 185 degree fahrenheit without any cooling. If you want to know more about what the community thinks about this “toasty” situation with the Pi 4 you can check out the links in the resources section.

Thus, taking into consideration all these factors, we highly recommend you to buy a case, heatsink, and fan combo for the Pi 4. See, a heat sink and a case were sufficient for previous raspberry pi models, but for the Pi 4, especially with its bump in performances needs an active cooling solution, aka Fans. In our case, we have bought a transparent acrylic case with fans and heatsink for the Pi 4. Usually, this combo comes with a pair of heat sinks. The bigger heatsink should go above the processor, and the smaller one should go above the RAM chip. If your combo has an extra heat sink, you may fix it on the USB Controller Chip. Please note that you should never apply a heat sink on the Radio Chip with the silver enclosure. This can interfere with wireless communication. Finally, after assembling the case, mount the fan and wire it up to the GPIO Pins that provide power. Please refer to the assembling instructions given for your case and cooling system combo, as this differs from product to product.

Now let’s look at how to correctly set up the hardware whenever we boot up the Raspberry Pi 4. Please follow the same order of interfacing whenever you have to set up the Raspberry Pi 4 from scratch. Although you don’t have to do in this sequence, following this will ensure that your Raspberry Pi 4 lives for a long time, and your OS won’t get corrupted easily.

Our normal tendency whenever we get something electronic is to power it. We recommend not to do this with the Pi 4.

First and foremost, insert the microSD card with the OS preinstalled in the Pi 4. We will cover the OS installation in the next section. The second step is to connect the input peripherals to your Pi 4. This can be your LAN cable, keyboard, mouse, or even a Pi camera on the CSI Connector. The third step is to connect any output peripherals like displays, speaker, or even a Pi Display on the DSI connector. The fourth and final step is to connect the power. Remember that the Pi 4 has no power ON or reset Button on the board, So you have to be careful not to yank in or out the power cable without following the proper boot up or shutdown procedure. Here we have shown the proper boot up procedure. In the next section, we will explain the proper shutdown procedure, as it got to deal with the software side of things.

Thus some of the hardware precautions you have to take boils down to these points. Always keep them in mind. Its better you write it down and stick it on your workbench.

1. Plug in the Power Last
2. Shutdown before removing the power supply
3. Shutdown & power Off before adding any new hardware
4. Watch out for static electricity
5. Let your Pi Breathe

If you have any further questions regarding the Pi 4 you may visit the FAQ link provided in the resources section. Furthermore, we strongly recommend that you watch this youtube video, where the Pi Engineers are interviewed. Please check the pinned comment on that video, to get timestamps on different topics they discuss. It's an amusing & informative video.

Summary

In this video, we have covered the following topics

* What are the Essential accessories needed
* Why we need these accessories &
* How to correctly set up the hardware for first boot

Section Summary

* Introduction to the course
* Getting acquainted with the credit card-sized computer
* Part 1: In-depth insights into the hardware features of the Raspberry Pi 4 Model B
* Part 2: In-depth insights into the hardware features of the Raspberry Pi 4 Model B
* Essential Accessories & Setting up the Hardware

In the next section, we will learn to correctly set up the software and work with the Raspberry Pi 4 OS called Raspbian Buster.