

Raspberry Pi Hardware Preparation and Installation

Hardware Guide:

For getting started with raspberry pi for the first time you will require the following hardware

1. Raspberry Pi (latest Model)
2. Monitor or TV
3. HDMI cable
4. Ethernet cable
5. USB keyboard
6. USB mouse
7. Micro USB power supply
8. 8GB or larger microSD card
9. SD Card Reader

Raspberry Pi 3 Model B:

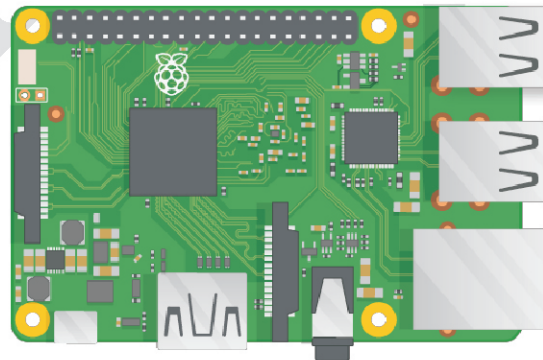
The Raspberry Pi 3 is the third generation Raspberry Pi. It replaced the Raspberry Pi 2 Model B in February 2016. Compared to the Raspberry Pi 2 it has:

A 1.2GHz 64-bit quad-core ARMv8 CPU
802.11n Wireless LAN
Bluetooth 4.1
Bluetooth Low Energy (BLE)

Like the Pi 2, it also has:

4 USB ports
40 GPIO pins
Full HDMI port
Ethernet port
Combined 3.5mm audio jack and composite video
Camera interface (CSI)
Display interface (DSI)
Micro SD card slot (now push-pull rather than push-push)
Video Core IV 3D graphics core

The Raspberry Pi 3 has an identical form factor to the previous Pi 2 (and Pi 1 Model B+) and has complete compatibility with Raspberry Pi 1 and 2.



Monitor or TV:

A monitor or TV with HDMI in can be used as a display with a Raspberry Pi. Most modern television sets and monitors have an HDMI port, and are the easiest to get working with the Raspberry Pi. You can use an HDMI cable to connect the Raspberry Pi directly to the television or monitor.

Some older monitors have a DVI port. These work well with the Raspberry Pi, although you'll need an HDMI-to-DVI adapter to attach to an HDMI cable, or a one-piece HDMI-to-DVI cable. Some old monitors have a VGA port. These can be trickier to use as you'll need an HDMI-to-VGA converter, which can change digital video to analogue video. A simple port adapter won't work.

HDMI to HDMI Cable:

Connect Raspberry Pi to a Monitor or TV with a HDMI to HDMI cable.

Ethernet cable:

Ethernet cable will allow your Pi to connect with the internet. It is also useful for headless setup of Raspberry Pi

USB Keyboard and Mouse:

Any standard USB keyboard and mouse can be used with the Raspberry Pi. This plug and play devices will work without any additional driver. Simply plug them into the Raspberry Pi and they should be recognised when it starts up.

Power Supply:

It is recommended that you use a 5V, 2A USB power supply for all models of Raspberry Pi.

SD Card:

The latest version of Raspbian, the default operating system recommended for the Raspberry Pi, requires an 8GB (or larger) micro SD card. SD card will store the operating systems as well as all the file and applications created by you.

Installation Guide:

Now since you have all the required hardware, we will now learn how to get the operating system onto your microSD card so that you can start using software on your Raspberry Pi

Get Raspbian OS on your microSD card:

Raspbian comes pre-installed with plenty of software for education, programming and general use. It has Python, Scratch, Sonic Pi, Java, Mathematica and more.

1. To download Raspbian log on to raspberrypi.org and click on the download, then click on Raspbian and lastly download the RASPBIAN JESSIE WITH DESKTOP file. You can choose either the Torrent file or ZIP file.
2. The downloaded file will be in zip format. To unzip the file, you will require an unzip tool. You can use any unzipping tool viz. WINRAR, 7ZIP etc. After unzipping the file, you will find a disc image file in the unzipped folder.
3. Now format the SD Card before writing the disc image file on the SD card. You can use SD Formatter tool or any other tool of your wish.
4. To write the image file of the operating system on the SD card you will require a Disk Imager tool. For this you can use Win32 Disk Imager tool.
5. Once the image is written on the SD Card, your untitled SD card will now have the name boot. Your SD Card will now hold the Raspbian Operating system required for the first-time setup.

Plugging in your Raspberry Pi:

1. Begin by placing your SD card into the SD card slot on the Raspberry Pi. It will only fit one way.
2. Next, plug your keyboard and mouse into the USB ports on the Raspberry Pi.
3. Make sure that your monitor or TV is turned on, and that you have selected the right input (e.g. HDMI 1, DVI, etc).
4. Connect your HDMI cable from your Raspberry Pi to your monitor or TV.
5. If you intend to connect your Raspberry Pi to the internet, plug an Ethernet cable into the Ethernet port, or connect a WiFi dongle to one of the USB ports (unless you have a Raspberry Pi 3).
6. When you're happy that you have plugged all the cables and SD card in correctly, connect the micro USB power supply. This action will turn on and boot your Raspberry Pi.

NOTE: for Raspberry Pi 4 please follow the instruction given below.

1. To download Raspberry pi OS (buster) log on to raspberrypi.com and click on the download and then click of raspberry pi os and click on **Raspberry pi OS buster**.
2. Follow the above mention step from 2 to 5 of **INSTALLATION GUIDE** section.
3. After writing the image on SD Card plug in the SD Card in to the Raspberry pi 4. If boot normally and you see the raspberry pi screen than ok. But if not than make the following changes in the SD card 'config' file with notepad++.
1. Uncomment the line 'hdmi_force_hotplug=1'
2. Uncomment the line 'hdmi_group=1'
3. Uncomment the line 'hdmi_mode=1'
4. Save and exit the 'config' file
5. Now insert again the memory card into the raspberry pi it will work.