

Raspberry Pi Raspberry-PI-4-1GB

Raspberry Pi 4 Model B (1GB) User Manual

Your Guide to Getting Started

1. OVERVIEW

The Raspberry Pi 4 Model B is a versatile single-board computer designed for a wide range of applications, from desktop computing to embedded projects. It features a powerful Broadcom BCM2711 Quad-core Cortex-A72 (ARM v8) 64-bit SoC running at 1.5GHz, offering enhanced processor speed, multimedia performance, memory, and connectivity compared to previous generations. This model comes with 1GB of LPDDR4-2400 SDRAM.

Key features include 2.4 GHz and 5.0 GHz IEEE 802.11ac wireless, Bluetooth 5.0, BLE, Gigabit Ethernet, two USB 3.0 ports, and two USB 2.0 ports. It also provides two micro-HDMI ports supporting up to 4Kp60, a 2-lane MIPI DSI display port, a 2-lane MIPI CSI camera port, and a 4-pole stereo audio and composite video port. Hardware video decoding (H.265 4Kp60, H.264 1080p60) and encoding (H.264 1080p30) are supported, along with OpenGL ES 3.0 graphics.

The device utilizes a Micro-SD card slot for operating system loading and data storage. Power is supplied via a 5V DC USB-C connector (minimum 3A) or via the GPIO header (minimum 3A). Power over Ethernet (PoE) is also supported with a separate PoE HAT.

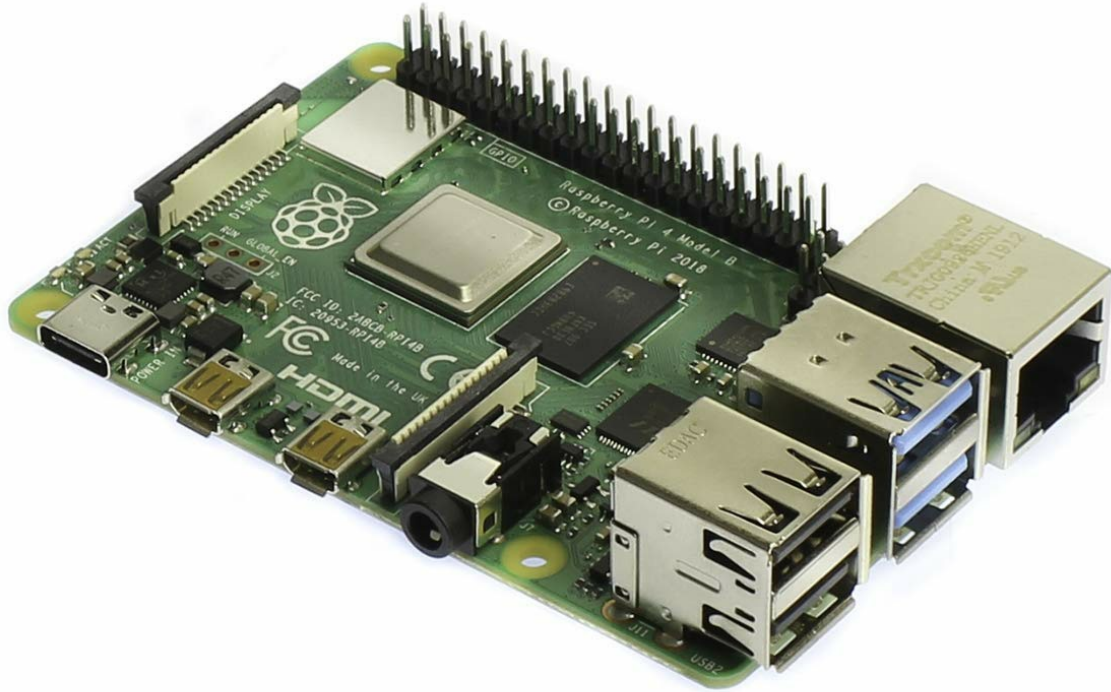


Figure 1: Raspberry Pi 4 Model B (1GB) main board.

2. PACKAGE CONTENTS

Your Raspberry Pi 4 Model B (1GB) package includes:

- Raspberry Pi 4 Model B (1GB) single-board computer
- Samsung 32GB SD Card (pre-loaded with Raspbian Buster)



Figure 2: Raspberry Pi 4 Model B product box.

3. HARDWARE COMPONENTS

Familiarize yourself with the various ports and components on your Raspberry Pi 4 Model B board:

- **Broadcom BCM2711:** Quad-core Cortex-A72 (ARM v8) 64-bit SoC @ 1.5GHz.
- **LPDDR4-2400 SDRAM:** 1GB memory.
- **Gigabit Ethernet:** For wired network connectivity.
- **2 USB 3.0 ports:** For high-speed peripheral connections.
- **2 USB 2.0 ports:** For standard peripheral connections.
- **2 micro-HDMI ports:** Supports dual display output up to 4Kp60.
- **USB-C power input:** 5V DC (minimum 3A) for power supply.

- **Micro-SD card slot:** For operating system and data storage.
- **40-pin GPIO header:** General Purpose Input/Output pins for interfacing with other hardware.
- **2-lane MIPI DSI display port:** For connecting a display.
- **2-lane MIPI CSI camera port:** For connecting a camera.
- **4-pole stereo audio and composite video port:** For audio and analog video output.

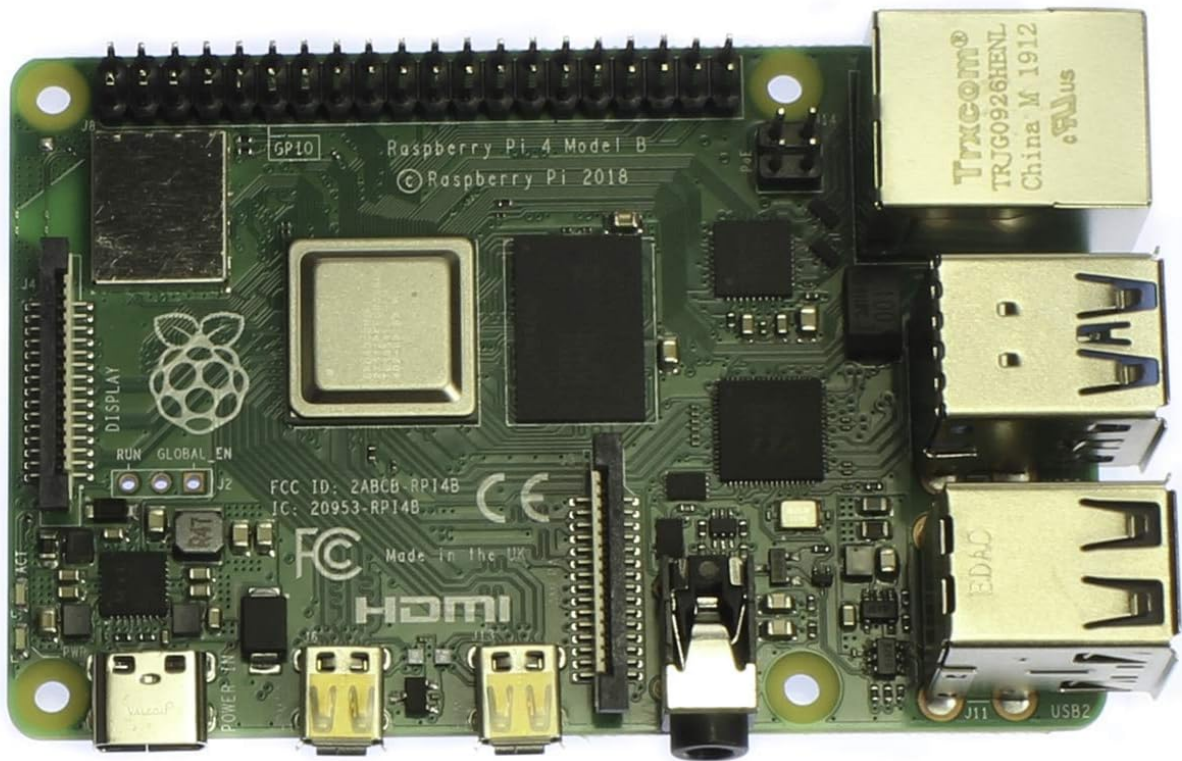


Figure 3: Top view of the Raspberry Pi 4 Model B board.

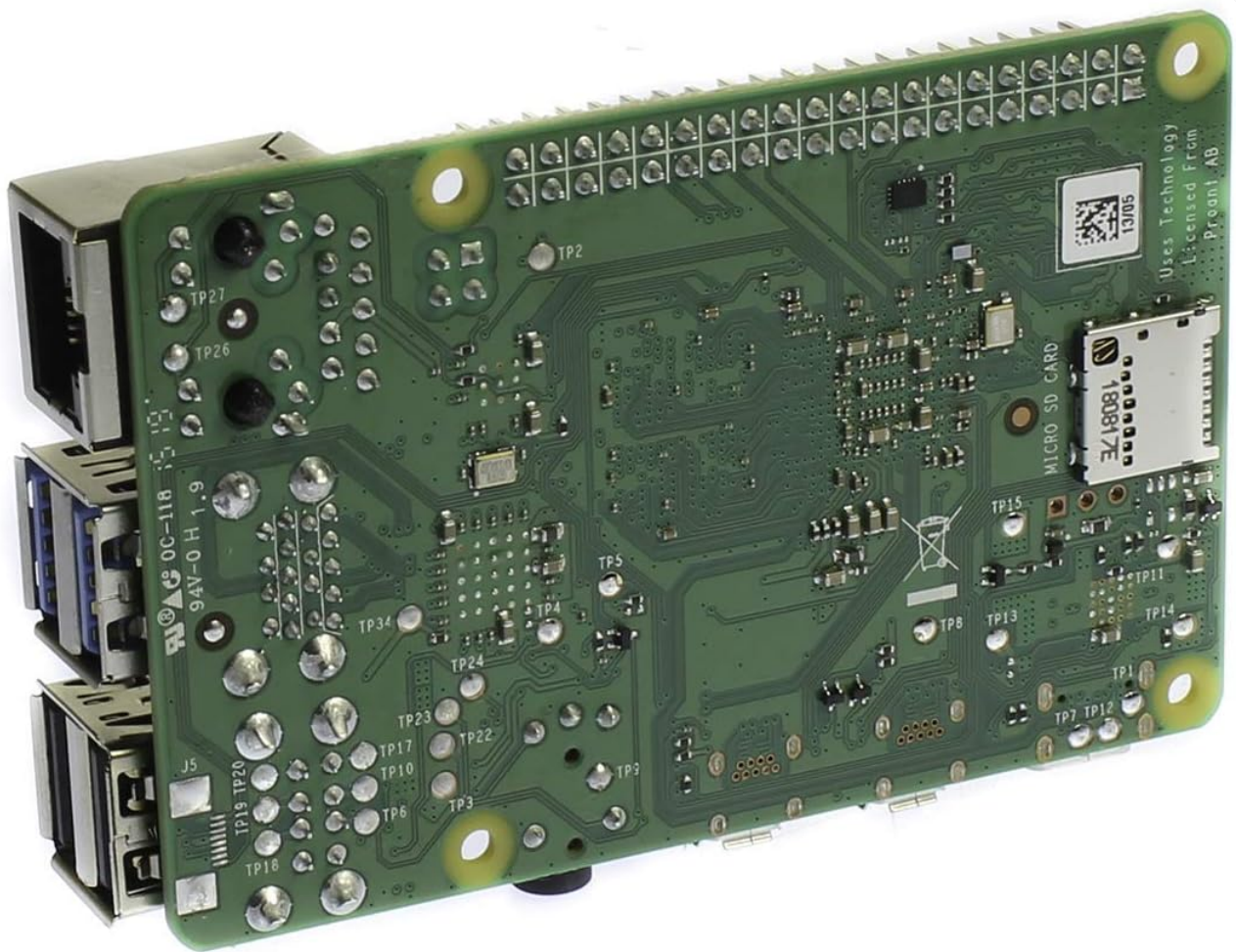


Figure 4: Bottom view of the Raspberry Pi 4 Model B board, highlighting the micro-SD card slot.

4. SETUP

The Raspberry Pi 4 Model B is designed for ease of use. This unit comes with a Samsung 32GB SD Card pre-loaded with Raspbian Buster (September 2019 update), requiring no initial setup for the operating system.

4.1 Initial Connection

1. **Insert Micro-SD Card:** Gently insert the pre-loaded Samsung 32GB Micro-SD card into the Micro-SD card slot on the underside of the Raspberry Pi board until it clicks into place.
2. **Connect Display:** Connect one or two micro-HDMI cables from the Raspberry Pi to your monitor(s).
3. **Connect Peripherals:** Plug in your USB keyboard and mouse into the available USB ports.
4. **Connect Network (Optional):** For wired internet access, connect an Ethernet cable to the Gigabit Ethernet port. Wi-Fi is also available.
5. **Connect Power:** Plug the 5V DC USB-C power supply (minimum 3A, not included) into the USB-C power input port. The Raspberry Pi will automatically power on and begin booting.

4.2 First Boot

Upon connecting power, the Raspberry Pi will boot directly into the Raspbian Buster desktop environment. Follow any on-screen prompts for initial configuration, such as setting your locale and password.

5. OPERATING SYSTEM

The recommended operating system for the Raspberry Pi is Raspbian, a Debian-based OS optimized for the Raspberry Pi hardware. Your included SD card comes with Raspbian Buster pre-installed.

5.1 Basic Usage

Once booted, you can interact with Raspbian Buster like any other desktop operating system. It includes a web browser, office suite, programming tools, and various utilities. Updates can be performed via the terminal using standard Debian commands (`sudo apt update` and `sudo apt upgrade`).

5.2 Raspberry Street Web Monitoring Platform

This Raspberry Pi is ready to work with the Raspberry Street web monitoring platform. To register your Pi, navigate to the `/home/raspberrystreet/` directory in the terminal and execute the command:`java -jar rsiothub.jar` (registration code). Obtain your specific registration code from the web dashboard of the Raspberry Street platform.

6. SPECIFICATIONS

Feature	Detail
Processor	Broadcom BCM2711, Quad-core Cortex-A72 (ARM v8) 64-bit SoC @ 1.5GHz
RAM	1GB LPDDR4-2400 SDRAM
Wireless Connectivity	2.4 GHz and 5.0 GHz IEEE 802.11 ac wireless, Bluetooth 5.0, BLE
Ethernet	Gigabit Ethernet
USB Ports	2 x USB 3.0 ports, 2 x USB 2.0 ports
HDMI Ports	2 x micro-HDMI ports (up to 4Kp60 supported)
Display Port	2-lane MIPI DSI display port
Camera Port	2-lane MIPI CSI camera port
Audio/Video	4-pole stereo audio and composite video port
GPIO Header	Raspberry Pi standard 40-pin GPIO header
Video Decoding	H.265 (4Kp60 decode), H.264 (1080p60 decode)
Video Encoding	H.264 (1080p30 encode)
Graphics	OpenGL ES 3.0 graphics
Storage	Micro-SD card slot
Power Input	5V DC via USB-C connector (minimum 3A), 5V DC via GPIO header (minimum 3A), Power over Ethernet (PoE) enabled (requires separate PoE HAT)
Operating Temperature	0 – 50 degrees C ambient
Dimensions	3.74"L x 2.76"W x 1.18"H
Weight	50 Grams

7. MAINTENANCE

To ensure optimal performance and longevity of your Raspberry Pi 4 Model B, consider the following maintenance tips:

- **Cooling:** The Raspberry Pi 4 can generate significant heat under heavy load. Ensure adequate ventilation. If using a case, consider one with passive cooling (heat sinks) or active cooling (a fan) to prevent thermal throttling and maintain performance.
- **Power Supply:** Always use a high-quality 5V DC power supply with a minimum current rating of 3A, especially if connecting multiple USB peripherals.

- **SD Card Care:** Regularly back up your Micro-SD card. Avoid sudden power loss during write operations to prevent data corruption.
- **Software Updates:** Keep your operating system and installed software up to date to benefit from the latest features, bug fixes, and security patches.

8. TROUBLESHOOTING

If you encounter issues with your Raspberry Pi 4 Model B, consider these common troubleshooting steps:

- **No Boot/Display:**
 - Ensure the Micro-SD card is properly inserted and contains a valid operating system image.
 - Verify the power supply meets the minimum 5V 3A requirement.
 - Check micro-HDMI cable connections and ensure your monitor is set to the correct input.
- **Overheating:**
 - If the device feels hot or performance degrades, ensure it has proper ventilation. Consider adding heat sinks or a fan.
- **Peripheral Issues:**
 - Try connecting peripherals to different USB ports.
 - Ensure external USB devices have their own power supply if they draw significant current.
- **Network Connectivity:**
 - For Wi-Fi, check network settings and ensure correct password entry.
 - For Ethernet, verify cable connection and router status.

9. WARRANTY AND SUPPORT

For warranty information and technical support, please refer to the official Raspberry Pi website or contact your retailer. Additional protection plans may be available for purchase separately.