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Orange Pi Orange Pi 4 Pro

Orange Pi 4 Pro 8GB Single Board Computer User Manual

Model: Orange Pi 4 Pro

1. PRODUCT OVERVIEW

The Orange Pi 4 Pro is a high-performance single board computer (SBC) designed for a wide range of applications, from embedded systems to AI development. It features an octa-core processor, a dedicated Neural Processing Unit (NPU), and extensive connectivity options.

Key Features:

- **High Performance CPU:** 2×Cortex-A76 + 6×Cortex-A55, clocked at up to 2.0GHz for efficient multitasking.
- **Dedicated NPU:** 3 TOPS NPU for accelerating AI tasks like face recognition and behavior detection, supporting INT8/INT16/FP16/BF16 multi-precision hybrid computing.
- **GPU + RISC-V Co-Processor:** Combines graphics processing with real-time control for optimized system resource allocation.
- **Wireless Connectivity:** Integrated Wi-Fi 6 and Bluetooth 5.4 for faster and more stable transmission.
- **Network:** Gigabit Ethernet with Power over Ethernet (PoE) support.
- **Operating System Support:** Compatible with Android, Debian, Ubuntu, and OpenHarmony.

What's in the Box:

- Orange Pi 4 Pro 8GB Single Board Computer



OrangePi 4 Pro

8GB
LPDDR5



8-Core ARM

Allwinner A733

3Tops@INT8

Wi-Fi 6.0+BT 5.4

Gigabit
Ethernet

Figure 1: Top view of the Orange Pi 4 Pro 8GB Single Board Computer, showing various ports and components.

2. SETUP GUIDE

This section outlines the steps required to set up your Orange Pi 4 Pro for initial use.

2.1 Power Supply

The Orange Pi 4 Pro requires a 5V/3A power supply connected via the Type-C power port. Ensure you use a stable and compatible power adapter to prevent operational issues.

2.2 Operating System Installation

The Orange Pi 4 Pro supports various operating systems, including Android, Debian, Ubuntu, and OpenHarmony. You will need to prepare an operating system image and flash it onto a compatible storage medium.

- Choose an OS:** Select your preferred operating system image from the official Orange Pi website or community resources.
- Prepare Storage:** Insert a MicroSD card (Class 10 or higher recommended) or an M.2 M-Key 2280 PCIe

NVMe SSD into the respective slot on the board. The board also supports eMMC/UFS storage.

3. **Flash Image:** Use a disk imaging tool (e.g., Etcher, Win32 Disk Imager) on a separate computer to write the OS image to your chosen storage medium.
4. **Insert Storage:** Once the image is flashed, insert the MicroSD card or M.2 SSD into the Orange Pi 4 Pro.

2.3 Initial Connections

Before powering on, connect the necessary peripherals:

- **Display:** Connect a monitor via the HDMI port.
- **Input Devices:** Connect a keyboard and mouse to the USB 2.0 or USB 3.0 ports.
- **Network:** For a wired connection, connect an Ethernet cable to the Gigabit Ethernet port.

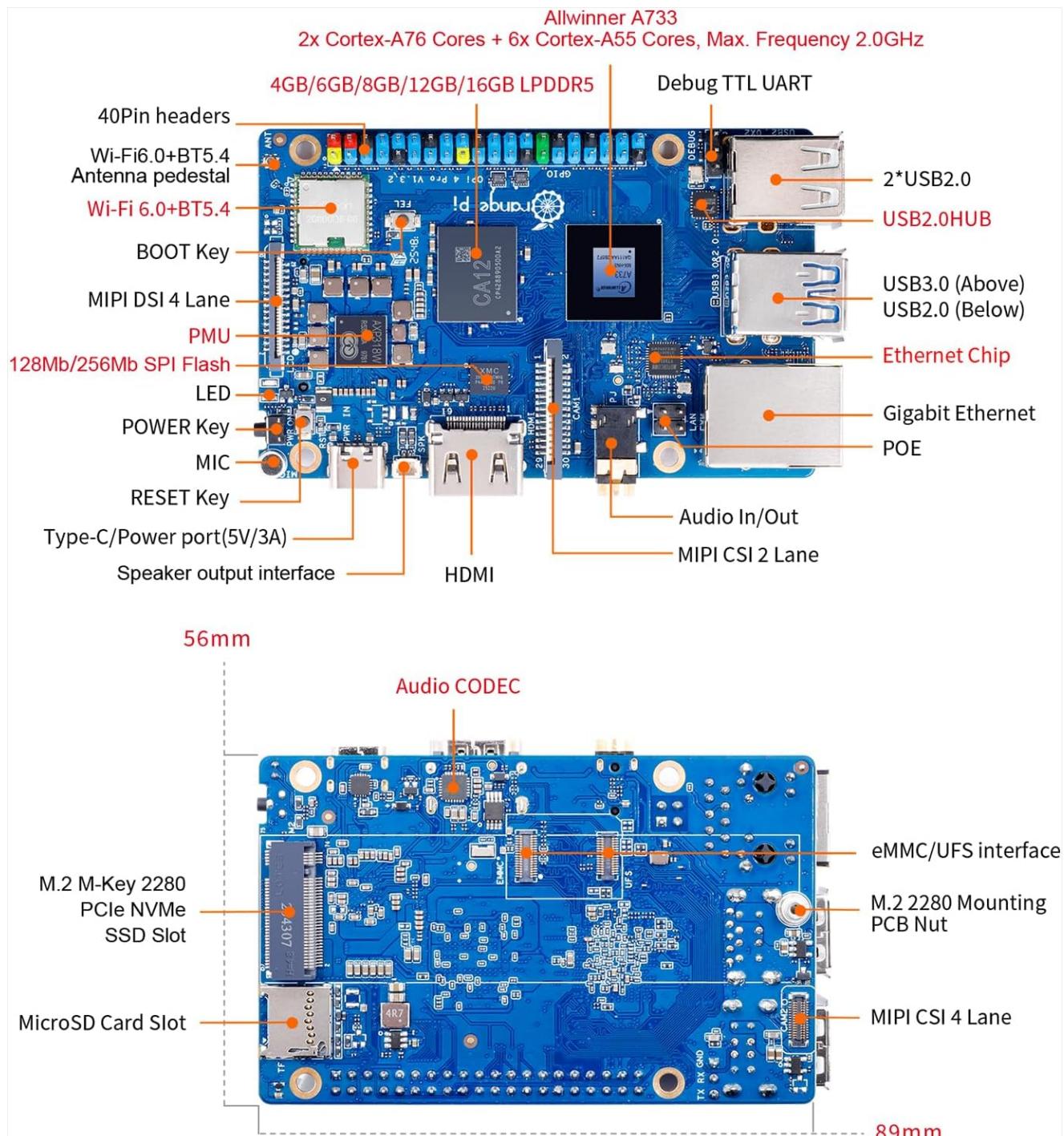


Figure 2: Detailed diagram of the Orange Pi 4 Pro, illustrating component locations, ports, and dimensions.

3. OPERATING INSTRUCTIONS

After completing the setup, you can power on and begin using your Orange Pi 4 Pro.

3.1 Powering On

Connect the 5V/3A Type-C power adapter. The board should automatically power on and begin booting the operating system from the installed storage medium. Observe the LED indicators for boot status.

3.2 Software Environment

Once the operating system has booted, you can interact with it using the connected display, keyboard, and mouse. Refer to the specific operating system documentation for detailed usage instructions.

3.3 Network Connectivity

- **Wi-Fi:** Configure Wi-Fi settings through the operating system's network manager. The board supports Wi-Fi 6 for high-speed wireless connections.
- **Bluetooth:** Enable and pair Bluetooth devices via the OS settings. Bluetooth 5.4 provides enhanced connectivity for peripherals.
- **Ethernet:** If an Ethernet cable is connected, the board should automatically establish a wired network connection. PoE support allows power and data transmission over a single cable, simplifying deployment.

3.4 GPIO Usage

The 40-pin GPIO header provides extensive expansion capabilities for connecting sensors, actuators, and other custom hardware. Refer to the pinout diagram and relevant software libraries for programming GPIO functions.

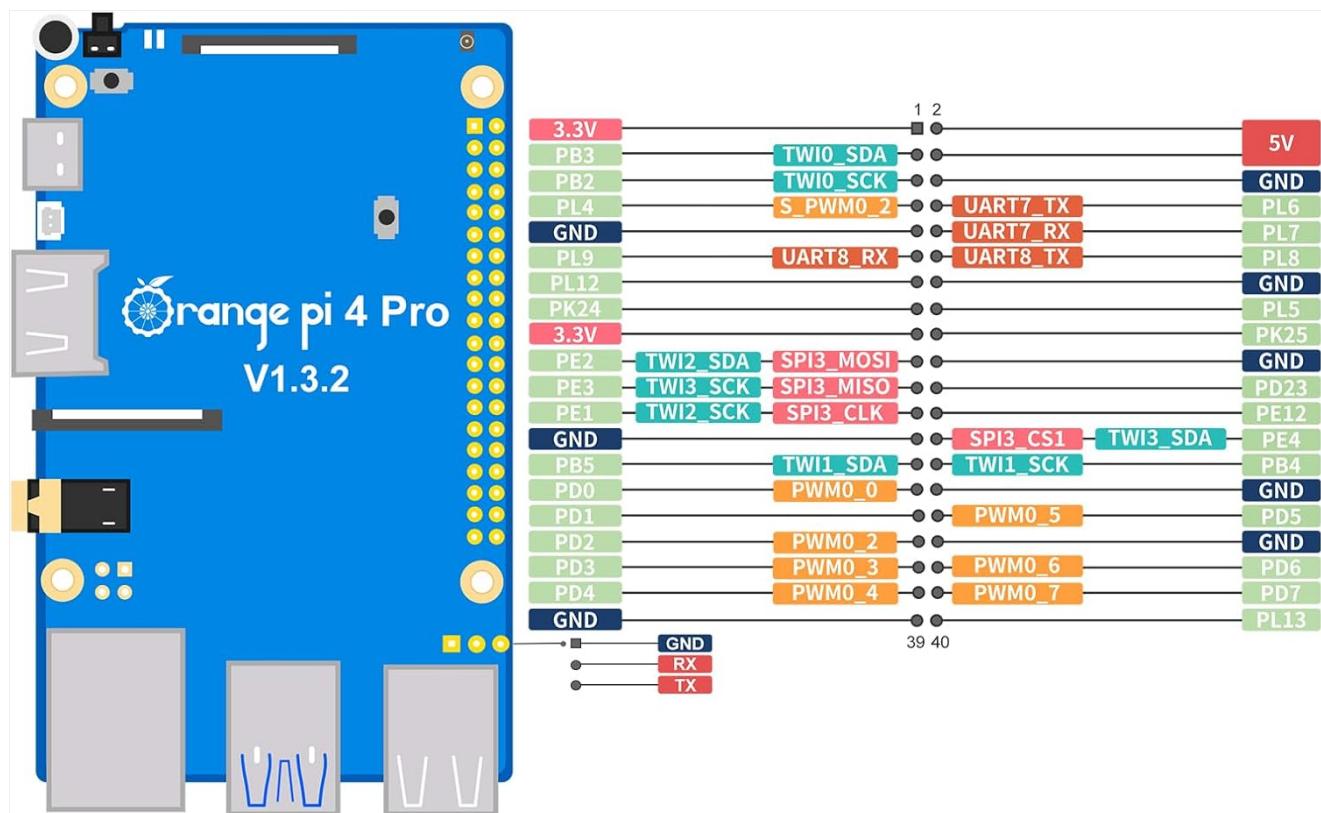


Figure 3: GPIO pinout diagram for the Orange Pi 4 Pro, detailing pin functions and voltage levels.

4. MAINTENANCE

Proper maintenance ensures the longevity and stable operation of your Orange Pi 4 Pro.

- **Keep Clean:** Regularly clean the board to prevent dust accumulation, which can lead to overheating. Use compressed air or a soft brush.
- **Environmental Conditions:** Operate the board within recommended temperature and humidity ranges. Avoid extreme conditions.
- **Power Supply:** Always use a stable and correctly rated power supply (5V/3A). Unstable power can damage the board.
- **Software Updates:** Keep your operating system and installed software up to date to benefit from bug fixes, security patches, and new features.
- **Safe Shutdown:** Always perform a proper software shutdown before disconnecting power to prevent data corruption on your storage medium.

5. TROUBLESHOOTING

This section provides solutions to common issues you might encounter.

5.1 Board Not Powering On

- **Check Power Supply:** Ensure the 5V/3A Type-C power adapter is correctly connected and functioning. Try a different compatible power supply if available.
- **Inspect Connections:** Verify all cables and peripherals are securely connected.

5.2 Boot Issues / No Display Output

- **Re-flash OS Image:** The operating system image on your MicroSD card or SSD might be corrupted. Try re-flashing the image using a reliable tool.
- **Verify Storage:** Ensure the MicroSD card or M.2 SSD is properly inserted and not faulty.
- **HDMI Connection:** Check the HDMI cable and monitor connection. Try a different HDMI cable or monitor if possible.

5.3 Network Connectivity Problems

- **Wired Ethernet:** Check the Ethernet cable and router connection. Verify network settings within the operating system.
- **Wi-Fi/Bluetooth:** Ensure wireless modules are enabled in the OS and drivers are correctly installed. Check for interference or incorrect network credentials.

5.4 General Performance Issues

- **Overheating:** Ensure adequate ventilation. Consider adding a heatsink or fan if running demanding applications.
- **Software Conflicts:** Check for recently installed software or configurations that might be causing instability.

For more advanced troubleshooting and community support, refer to the official Orange Pi forums and documentation.

6. SPECIFICATIONS

Below are the technical specifications for the Orange Pi 4 Pro 8GB Single Board Computer.

Feature	Specification
Processor	Allwinner A733 (2×Cortex-A76 + 6×Cortex-A55, up to 2.0GHz)
NPU	3 TOPS, supports INT8/INT16/FP16/BF16
RAM	8GB LPDDR5
Storage Options	MicroSD Card Slot, M.2 M-Key 2280 PCIe NVMe SSD Slot, eMMC/UFS interface
Wireless Connectivity	Wi-Fi 6, Bluetooth 5.4
Network	Gigabit Ethernet with PoE Support
Video Output	HDMI
USB Ports	USB 3.0, USB 2.0
Power Input	Type-C (5V/3A)
Operating Systems	Android, Debian, Ubuntu, OpenHarmony
Dimensions	Approximately 3.5 x 2.2 x 0.5 inches
Weight	Approximately 2 ounces

7. WARRANTY AND SUPPORT

For specific warranty details, please refer to the purchase documentation or contact your vendor directly. Warranty terms may vary based on region and retailer.

Software support for Orange Pi products is largely community-driven. Official documentation, forums, and community resources are available online to assist with operating system installation, configuration, and development. It is recommended to consult these resources for the latest information and assistance.

Manufacturer: Shenzhen Xunlong Software CO.,Limited