

## WayPonDEV ROC-RK3566-PC

# WayPonDEV Firefly ROC-RK3566-PC Single Board Computer User Manual

Model: ROC-RK3566-PC

## 1. INTRODUCTION

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This manual provides detailed instructions for the setup, operation, and maintenance of your WayPonDEV Firefly ROC-RK3566-PC Single Board Computer. The ROC-RK3566-PC is a high-performance, low-power single board computer featuring the Rockchip RK3566 quad-core 64-bit processor, designed for various applications including embedded systems, AI development, and home entertainment.

Please read this manual thoroughly before using the device to ensure proper functionality and to prevent damage.

## 2. PACKAGE CONTENTS

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Verify that all items are present in your package:

- 1 x ROC-RK3566-PC development board (4GB RAM + 32G eMMC)
- Additional accessories may vary by retailer.

## 3. SETUP

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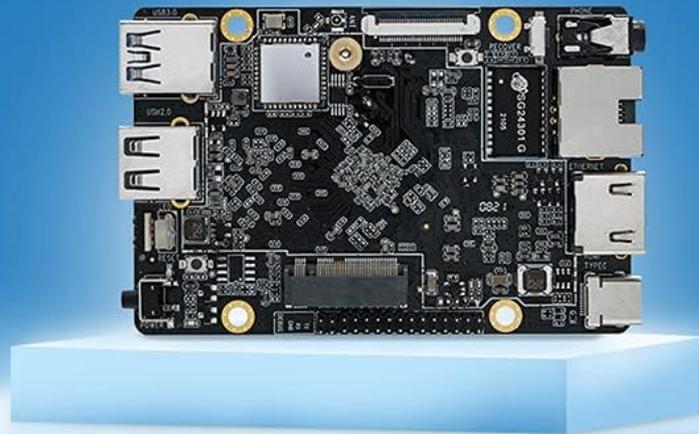
### 3.1 Connecting Peripherals

Before powering on the ROC-RK3566-PC, connect all necessary peripherals.

1. **Display Connection:** Connect a monitor or display to the HDMI2.0 port or MIPI DSI port.
2. **USB Devices:** Connect your keyboard, mouse, or other USB devices to the available USB3.0 and USB2.0 ports.
3. **Network Connection:** For wired network access, connect an Ethernet cable to the Gigabit Ethernet (RJ45) port. For wireless, ensure your WiFi antenna is connected (if external) or that the internal antenna is unobstructed.
4. **Storage Expansion (Optional):** If using an NVMe SSD, install it into the M.2 PCIe2.0 interface. For TF card storage, insert the card into the TF-Card Slot.
5. **Camera (Optional):** Connect a compatible MIPI-CSI camera to the MIPI-CSI camera interface.

# ROC-RK3566-PC QUAD-CORE 64-BIT MINI COMPUTER

Equipped with RK3566 quad-core 64-bit processor, the mini computer supports 8G large RAM. M.2 interface enables expansion with large hard drive. Various systems and boot ways are supported — with the dedicated application programs and forums, geek fun is endless.



## RK3566 QUAD-CORE 64-BIT PROCESSOR

RK3566 quad-core 64-bit Cortex-A55 processor has frequency up to 1.8GHz — the efficiency is greatly improved. With 22nm lithography process, it features low power consumption and high performance.



Figure 3.1: Overview of the ROC-RK3566-PC board showing various interfaces.

### 3.2 Powering On

After connecting all peripherals, connect a 5V power supply (via Type-C port) to the ROC-RK3566-PC. The system will typically boot automatically. Observe the power indicator LED for status.

## 4. OPERATING INSTRUCTIONS

## 4.1 Supported Operating Systems

The ROC-RK3566-PC supports a variety of operating systems, allowing for flexible development and usage scenarios:

- Android 11.0
- Ubuntu 18.04
- Buildroot + QT
- Station OS (Firefly Geek System)

Systems can be booted via TF card, U disk, or the onboard eMMC.

## VARIOUS SYSTEMS AND BOOT WAYS SUPPORTED

The master-slave integrated solution can be used as a USB device to output visual processing data and images to a computer. It can also be used as an IPCAM monitoring and recognition front end to connect to the NVR through the network port, and it can also be connected to a 1080P screen through MIPI to combine with human face recognition or AI vision terminals



## ULTRA SMALL SIZE, EASY TO INTEGRATE

Equipped with an all-aluminum alloy shell, efficient heat dissipation, ultra-small size, space saving, and can be flexibly embedded in various AI products



# ABUNDANT RESOURCES FOR CUSTOMIZATION

A complete SDK, development documents, examples, technology documents, tutorials and other resources are provided for the users to make a further customization.



Figure 4.1: Station OS (Firefly Geek System) interface for home entertainment.

## 4.2 Key Features and Capabilities

The ROC-RK3566-PC is equipped with advanced hardware for diverse applications:

- **Processor:** RK3566 quad-core 64-bit Cortex-A55 processor with frequency up to 1.8GHz, built on a 22nm lithography process for efficiency.
- **Memory:** 4GB LPDDR4 RAM and 32GB eMMC storage.
- **Graphics (GPU):** Integrated dual-core GPU supporting OpenGL ES3.2/2.0/1.1 and Vulkan1.1.
- **Video Processing (VPU):** Capable of 4K 60fps H.265/H.264/VP9 video decoding and 1080P 60fps H.265/H.264 video encoding.
- **Neural Processing Unit (NPU):** High-efficiency NPU supporting one-click switching of mainstream AI frameworks like Caffe/TensorFlow.
- **Storage Expansion:** M.2 PCIe2.0 interface for NVMe SSDs, offering high-speed data transfer.

# 8GB LARGE RAM, ALL-DATA-LINK ECC

It supports up to 8GB RAM with up to 32Bit width, and supports all-data-link ECC, making data safer and more reliable, and meeting the requirements of running large-memory products application.



## INTEGRATED CO-PROCESSORS

It is integrated with dual-core GPU, high-performance VPU and high-efficiency NPU. The GPU supports OpenGL ES3.2/2.0/1.1, Vulkan1.1. The VPU can achieve 4K 60fps H.265/H.264/VP9 video decoding and 1080P 100fps H.265/ H.264 video encoding. The NPU supports one-click switching of mainstream frameworks like Caffe/TensorFlow.

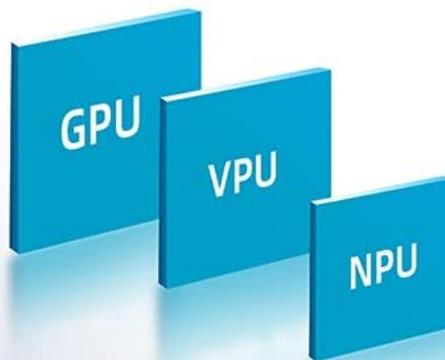


Figure 4.2: RK3566 Processor details, highlighting quad-core, 64-bit, Cortex-A55, 1.8GHz, Mali-G52, and 22nm features.

## M.2 INTERFACE TO EXPAND

The onboard M.2 PCIe2.0 interface can be connected with NVMe SSD, owning the advantages of high-speed reading and writing and large storage.



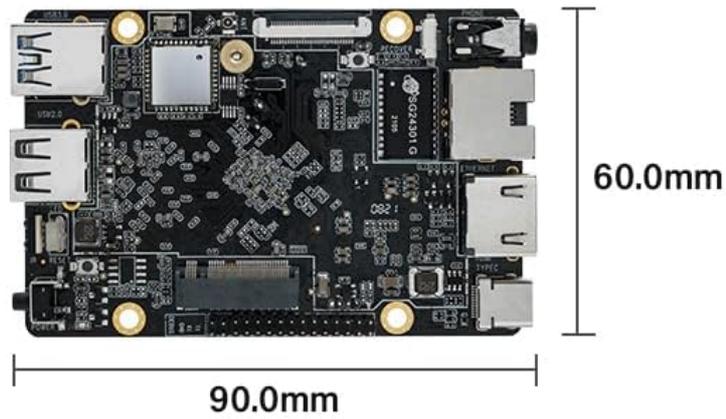
## CONFIGURED WITH GEEK SYSTEM

Station OS (Firefly Geek System) brings you living room playing experience. Just connect the TV or display at home to build a home entertainment center to enjoy movies and games with high-definition and big-screen viewing.



Figure 4.3: RAM features, including 8GB capacity and all-data-link ECC support.

# PRODUCT PARAMETERS



Specifications	
SOC	RockChip RK3566
CPU	Quad-core 64-bit Cortex-A55, 22nm lithography process, frequency up to 1.8GHz
GPU	ARM G52 2EE
	Supports OpenGL ES 1.1/2.0/3.2. OpenCL 2.0. Vulkan 1.1 Embedded high-performance 2D acceleration hardware
NPU	0.8Tops@INT8, integrated high-performance AI accelerator RKNN NPU
	Supports one-click switching of Caffe/TensorFlow/TFLite/ONNX/PyTorch/Keras/Darknet
VPU	Supports 4K 60fps H.265/H.264/VP9 video decoding
	Supports 1080P 100fps H.265/H.264 video encoding
	Supports 8M ISP
RAM	2GB / 4GB / 8GB LPDDR4
	32Bit,supports all-data-link ECC
Storage	32GB / 64GB / 128GB eMMC
	M.2 PCIe 2.0 × 1 (Expand with 2242 NVMe SSD)
	TF-Card Slot x1 (Expand with TF card)

Figure 4.4: M.2 interface for NVMe SSD expansion, illustrating high-speed reading and writing capabilities.

## 5. SPECIFICATIONS

Detailed technical specifications for the ROC-RK3566-PC:

Hardware Features	
Ethernet	Supports Gigabit Ethernet (RJ45. 1000 Mbps)
WiFi	Supports dual-band WiFi (802.11 a/b/g/n)
	Supports BT5.0
Display	1 × HDMI2.0. Supports 4K@60fps output
	1 × MIPI DSI. Supports 1920*1080@60fps output (or dual-channel 1 × MIPI DSI 2560*1440@60fps) /p>
Audio	1 × HDMI audio output
	1 × Earphone output
Camera	1 × MIPI-CSI camera interface
Power	5V (Via Type-C port)
Interface	HDMI2.0, USB3.0, USB2.0, MIPI DSI, MIPI CSI, I2C, SPI, UART, ADC, PWM, GPIO, PCIe, I2S, etc.
OS/Software	
OS	Supports Android 11.0, Ubuntu 18.04, Buildroot + QT, Station OS
General	
Size	90.0 mm × 60.0 mm
Operating Temperature	-10°C ~ 60°C
Storage Temperature	-20°C ~ 70°C
Storage Humidity	10% ~ 80 %

Figure 5.1: Comprehensive product parameters and hardware features.

**Table 5.1: General Specifications**

Feature	Description
Processor	Rockchip RK3566, Quad-core 64-bit Cortex-A55, up to 1.8 GHz
GPU	ARM G52 2EE, Supports OpenGL ES 3.2/2.0/1.1, Vulkan 1.1
NPU	0.8TOPS@INT8, supports Caffe/TensorFlow/TFLite/ONNX/PyTorch/Keras/Darknet
RAM	4GB LPDDR4
Storage	32GB eMMC (expandable via M.2 PCIe 2.0 for NVMe SSD and TF-Card Slot)
Display Output	1 x HDMI2.0 (4K@60fps), 1 x MIPI DSI (1920*1080@60fps or 2560*1440@60fps)
Audio	HDMI audio output, 1 x Earphone output

Feature	Description
Connectivity	Gigabit Ethernet (RJ45), Dual-band WiFi (802.11 a/b/g/n/ac), Bluetooth 5.0
USB Ports	1 x USB3.0, 2 x USB2.0
Other Interfaces	MIPI CSI, I2C, SPI, UART, ADC, PWM, GPIO, PCIe, I2S
Power Input	5V (via Type-C port)
Operating System Support	Android 11.0, Ubuntu 18.04, Buildroot + QT, Station OS
Dimensions	90.0 mm x 60.0 mm (3.54 x 2.36 x 0.39 inches)
Weight	1.41 ounces
Operating Temperature	-10°C ~ 60°C
Storage Temperature	-20°C ~ 70°C
Storage Humidity	10% ~ 80%

## 6. MAINTENANCE

### 6.1 General Care

- Keep the device in a clean, dry environment, away from direct sunlight and extreme temperatures.
- Avoid exposing the device to water or other liquids.
- Do not drop or subject the device to severe impacts.
- Ensure proper ventilation to prevent overheating, especially during intensive operations.

### 6.2 Cleaning

Use a soft, dry cloth to clean the exterior of the device. Do not use harsh chemicals or abrasive cleaners.

## 7. TROUBLESHOOTING

This section addresses common issues you might encounter with your ROC-RK3566-PC.

**Table 7.1: Common Troubleshooting Steps**

Problem	Possible Cause	Solution
Device does not power on	No power supply or faulty power adapter/cable.	Ensure the 5V Type-C power adapter is correctly connected and functional. Try a different power source or cable.
No display output	Incorrect display connection or faulty cable/monitor.	Check HDMI/MIPI DSI cable connections. Ensure the monitor is powered on and set to the correct input. Try a different cable or monitor.
Operating system fails to boot	Corrupted OS image or incorrect boot device.	Verify the OS image on your eMMC, TF card, or U disk. Ensure the boot order is correctly configured if applicable. Re-flash the OS image if necessary.

Problem	Possible Cause	Solution
Peripheral (USB, Ethernet, WiFi) not working	Driver issues, faulty peripheral, or loose connection.	Check physical connections. Ensure the operating system has the necessary drivers installed. Test with a different peripheral device.

## 8. WARRANTY AND SUPPORT

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For warranty information and technical support, please refer to the documentation provided with your purchase or visit the official WayPonDEV website. Support resources, including SDKs, development documents, and tutorials, are available to assist with customization and development.