

# OpenWRT One

## URLs

- [\[OpenWrt Wiki\] OpenWrt One](#)
- [\[OpenWrt Wiki\] Quick start guide for OpenWrt installation](#)
- [Banana Pi OpenWrt One Router | BananaPi Docs](#)

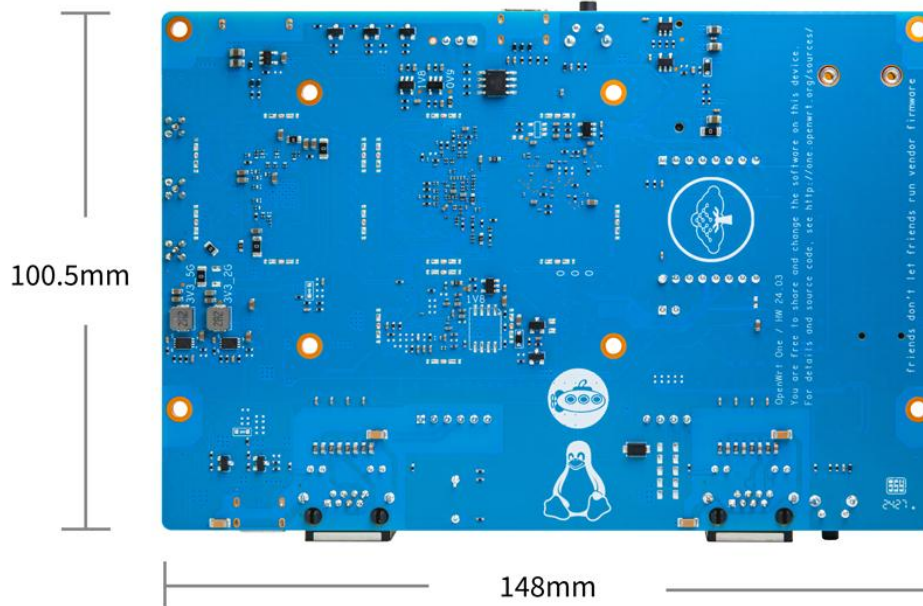
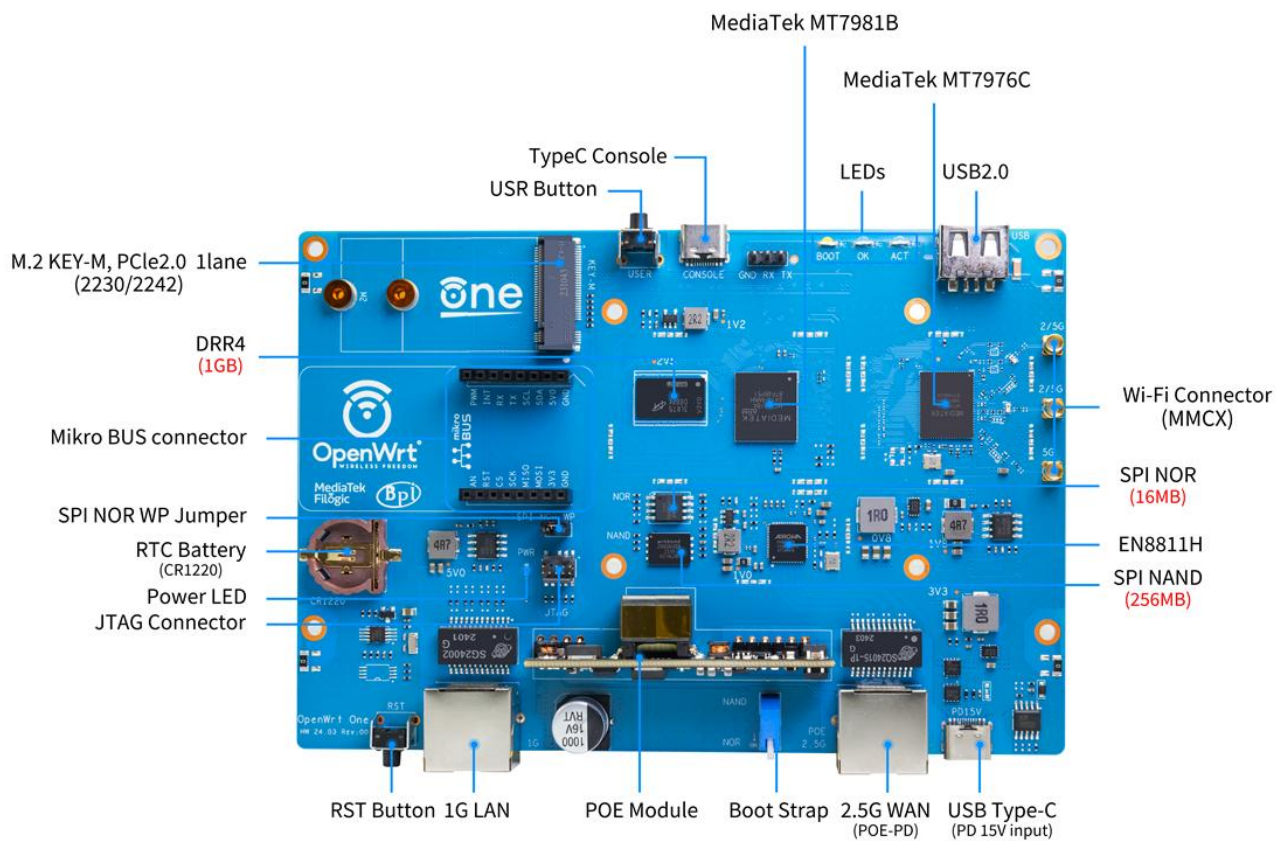
## Hardware

### Specification

SoC	MediaTek MT7981B (Filologic 820) dual-core Cortex-A53 processor @ 1.3 GHz
System Memory	1GB DDR4
Storage	<ul style="list-style-type: none"><li>• 256 MB SPI NAND flash for U-boot and Linux</li><li>• 16 MB SPI NOR flash for write-protected (by default) recovery bootloader (reflashing can be enabled with a jumper)</li><li>• Two types of flash devices are used to make the board almost unbrickable</li><li>• M.2 2242/2230 socket for NVMe SSD (PCIe gen 2 x1)</li></ul>
Networking	<ul style="list-style-type: none"><li>• 1 x 2.5GbE RJ45 port</li><li>• 1 x Gigabit Ethernet RJ45 port</li><li>• Dual-band WiFi 6 via MediaTek MT7976C (2x2 2.4 GHz + 3x3/2x2 + zero-wait DFS 5Ghz)</li><li>• 3x MMCX antenna connectors</li></ul>
USB	<ul style="list-style-type: none"><li>• 1x USB 2.0 Type-A host port</li><li>• USB Type-C (device, console) port using Holtek HT42B534-2 UART to USB chip</li></ul>
Expansion	MikroBUS socket for expansion modules
Debugging	Console via USB-C port or 3-pin header, 10-pin JTAG/SWD header for main SoC
RTC	support RTC onboard

Misc	<ul style="list-style-type: none"><li>• Reset and User buttons</li><li>• Boot select switch: NAND (regular) or NOR (recovery)</li><li>• 2x PWM LEDs, 2x Ethernet LED (GPIO driven)</li><li>• EM6324 External hardware watchdog</li><li>• NXP PCF8563TS (I2C) RTC with battery backup holder for CR1220 coin-cell</li></ul>
Power Supply	<ul style="list-style-type: none"><li>• 15V USB-PD on USB-C port</li><li>• Optional 802.3at/af PoE via RT5040 module</li></ul>
Dimensions	148 x 100.5 mm compatible with Banana Pi BPI-R4 case design
Certifications	FCC/EC/RoHS compliance

# Interface



## Installation

## Firmware Download

- Download1: [https://firmware-selector.openwrt.org/?version=24.10.1&target=mediatek%2Ffillogic&id=openwrt\\_one](https://firmware-selector.openwrt.org/?version=24.10.1&target=mediatek%2Ffillogic&id=openwrt_one)
- Download2: <https://downloads.openwrt.org/releases/>

## First Power up

?????????Openwrt One?????????????????????OpenWrt??????

1. ???????????? NAND/NOR ?????? NAND
2. ??????? 192.168.1.1 ??????? 1G ???
3. ?????????????????????????
4. ??????? 192.168.1.1 ??? LuCI GUI??????????? `ssh root@192.168.1.1` ?

## FAQ

### Why are there are 2 different flash chips?

The idea is to make the device (almost!) unbrickable and very easy to recover.

- NAND will hold the main loader (U-Boot) and the Linux image and will be the default boot device
- NOR will be write-protected by default (with WP jumper available on the board) and will hold a recovery bootloader (and other essential data, like Wi-Fi calibration)
- a dedicated boot select switch will allow changing between NOR and NAND

### What will the M.2 slot be used for?

We will use M.2 with M-key for NVMe storage. There is a work-in-progress patch to make PCIe work inside the U-Boot bootloader. This will allow booting other Linux distributions such as Debian and Alpine directly from NVMe.

### Why is there no USB 3.x host port on the device?

The USB 3.x and PCIe buses are shared in the selected SoC silicon, hence only a single High-Speed USB port is available

### What is the purpose of the console USB-C port?

Holtek UART to USB bridge with CDC-ACM support on USB-C makes the device ultra easy to communicate with. No extra hardware or drivers will be required. Android for example has CDC-ACM support enabled by default.

## What MAC OUI will the device have?

We plan to register an OUI block for OpenWrt which can also be used for other vendor extensions such as Wi-Fi beacon IEs.

## What is the purpose of the mikroBUS connector?

mikroBUS was chosen as we wanted to make the hardware extendable. There are dedicated pins for UART, SPI, I2C buses and RST/INT signals. The standard uses regular 2.54 mm pitch connectors (you can use available mikroBUS modules or just connect to it something else, with 2.54 mm jumper cables).

## Why have the RTC on board instead of a mikroBUS module?

We believe there are many things a Wi-Fi (or networking in general) device should have on-board by default. Always having a correct time on the device is crucial in many applications, like VPN, DNSSEC, ...

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