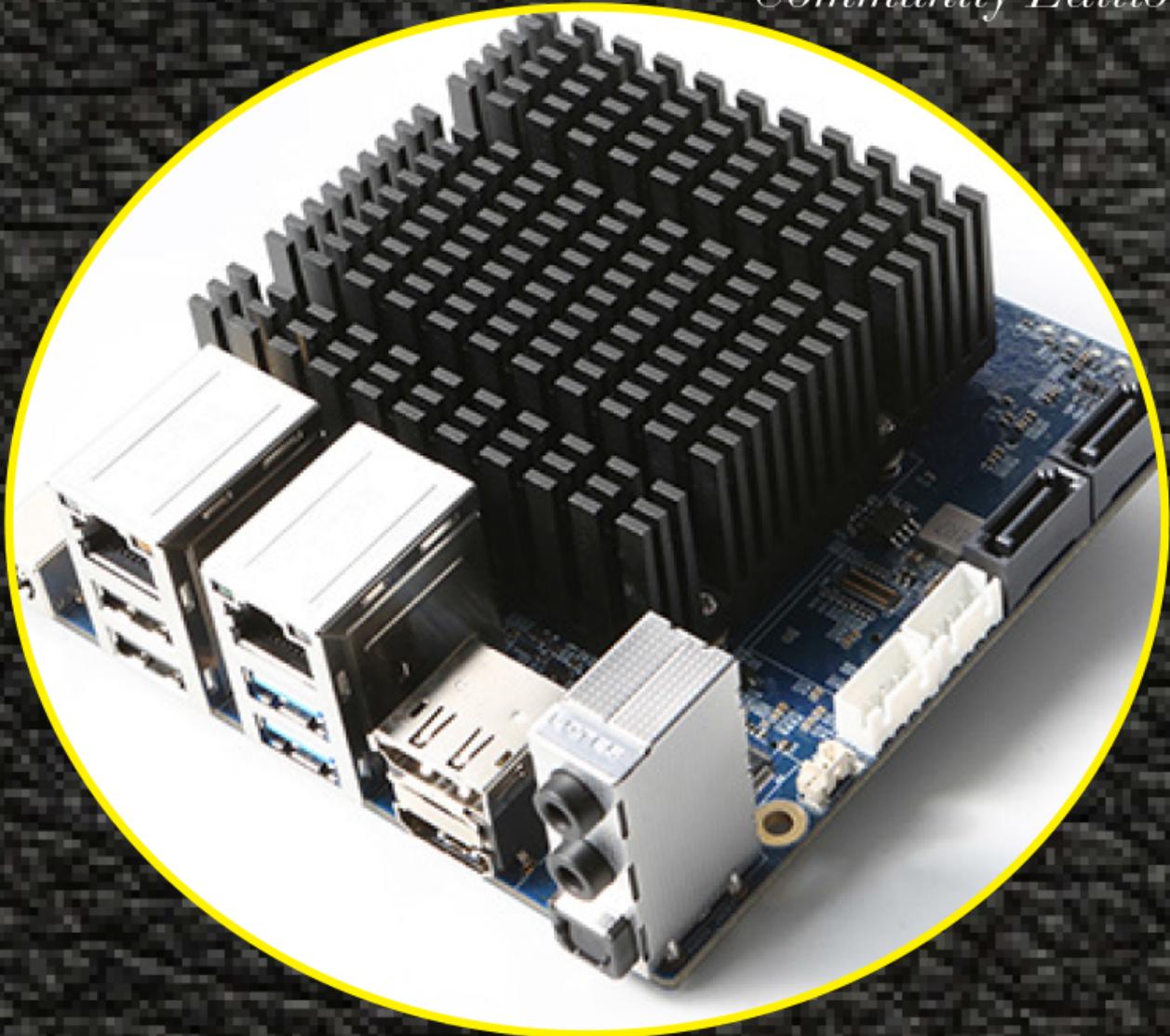


This machine is as fast as you typing until you get blisters in your fingers!

ODROID

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MORE BRAIN • MORE BRAWN

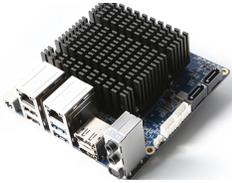
NEW X86 H2+



Setting up the ODROID-H2+: Installing the H2+ NIC Driver

© July 1, 2020

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ODROID-H2+: The New And Enhanced X86 Platform

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The ODROID-H2 is back, this time in a slightly upgraded form - named aptly, the ODROID-H2+! Accordingly the board revision code is REV-B+ (while the previous production batch was REV-B). We announced the original ODROID-H2 back in November 2018, as a new generation of single board computer (SBC) - an [▶](#)

Setting up the ODRUID-H2+: Installing the H2+ NIC Driver

© July 1, 2020 By Joshua Tutorial, ODRUID-H2+

Realtek PCIe FE / GBE / 2.5G / Gaming Ethernet Family Controller Software

Network Interface Controllers > 2.5G Gigabit Ethernet > PCI Express

RTL8125 / RTL8125B(S)

Network Interface Controllers > 10/100/1000M Gigabit Ethernet > PCI Express

RTL8111B/RTL8111C/RTL8111D/RTL8111E/RTL8111F/RTL8111G(S)/RTL8111H(S)/RTL8118(A)(S)/RTL8119/RTL8111L/RTL8111K

RTL8168B/RTL8168E/RTL8168H

RTL8111DP/RTL8111EP/RTL8111FP

RTL8411/RTL8411B

Network Interface Controllers > 10/100M Fast Ethernet > PCI Express

RTL8101E/RTL8102E/RTL8103E/RTL8105E/RTL8106E/RTL8107E

RTL8401/RTL8402

Windows

Download	Description	Version	Update Time	File Size
	Win8, Win8.1 and Server 2012 Auto Installation Program (Sid:1152921505689747773)	8.076	2020/06/02	10 MB
	Win10 Auto Installation Program (Sid:1152921505689747939)	10.039	2020/06/02	10 MB
	Win7 and Server 2008 R2 Auto Installation Program (Sid:1152921505689747774)	7.130	2020/06/02	10 MB
	Dash In-Band Config for Windows	1.04	2020/01/07	252 KB

The original H2 and H2 REV.B carried two 1GbE NIC whose driver is included in both Windows 10 and recent Linux distributions. On the other hand the ODRUID H2+ is equipped with two 2.5GbE NIC based on the Realtek 8125B chipset. This chipset is rather recent and its support in Windows 10, while present, is lackluster and even non-existing on many recent Linux distributions.

For Linux, see the discussion here: <https://www.spinics.net/lists/netdev/msg658594.html>

So as of this writing (June 2020) and in both cases, Windows 10 and Linux, you have to manually install the Realtek 8125B driver after you have installed the operating system. There is no doubt that the driver will end up in the upstream OSes at some point, but for now you have to install the driver yourself. It's a rather simple affair anyway.

Requisites

- This page assumes that you have an Internet connection via wireless or cellphone hotspot. In both cases, temporarily plugging in a USB wifi adapter, such as the ODRUID 300Mbps.
- If you do not have a wireless network or wifi adapter available, you can still reach the Internet via phone USB tethering. If you are going to use phone USB tethering, follow the instructions at the bottom of this page and then come back here.

For Linux it is a good idea to plug in the wireless thumb at OS install time so that you can connect to the wireless network while installing and then update the installation before installing the driver.

If you have a phone hotspot or phone USB tethering, check the section Connecting to Internet if you are not sure about how to connect with your phone.

If you cannot connect your ODRUID-H2+ to the Internet via wireless, hotspot or tethering, you can download the necessary files on another PC, copy them to a USB drive and then plug that USB key into

the H2+. See section Installing without Internet at the bottom of this page (Linux). For Windows, just copy the installer and run it as described below.

Windows 10

Once you have installed Windows 10 as well as updated it with all the current patches, go to the Realtek driver download page at: <https://www.realtek.com/en/component/zoo/category/network-interface-controllers-10-100-1000m-gigabit-ethernet-pci-express-software>

Download Win10 Auto Installation Program (Sid:1152921505689747939):

Realtek PCIe FE / GBE / 2.5G / Gaming Ethernet Family Controller Software

Network Interface Controllers > 2.5G Gigabit Ethernet > PCI Express
RTL8125 / RTL8125B(S)
Network Interface Controllers > 10/100/1000M Gigabit Ethernet > PCI Express
RTL8111B/RTL8111C/RTL8111D/RTL8111E/RTL8111F/RTL8111G(S)/RTL8111H(S)/RTL8111A(S)/RTL8119/RTL8111L/RTL8111K
RTL8168B/RTL8168E/RTL8168H
RTL8111DP/RTL8111EP/RTL8111FP
RTL8411/RTL8411B
Network Interface Controllers > 10/100M Fast Ethernet > PCI Express
RTL8101E/RTL8102E/RTL8103E/RTL8105E/RTL8106E/RTL8107E
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	Dash In-Band Config for Windows	1.04	2020/01/07	252 KB
	Diagnostic Program for Win7/Win8/Win10	2.0.4.2	2019/06/13	13 MB

Realtek Download Page

Unzip the archive, run the installer following the instructions. Once the installation is completed, you can check for the presence of the two NICs in Settings looking for View Network Connections. If they do not appear, reboot and go back to Settings afterwards. If you want to let the connection(s) use DHCP, you have nothing more to do. You're done.

Linux

There are at least two ways you can install the Realtek 8125B driver:

- Download the .deb package Hardkernel prepared and install it. This is GUI-based and perfect for users not confident enough with the console. This method only works for Debian-based Linux distributions, such as Ubuntu and many others. If you are not using a Debian-based Linux distribution, you have to manually install the driver. We are not as of this writing providing the package in other formats, i.e. RPM file.

- Download the driver source code, build it and install it. For users used to do such manual builds, it is quite easy

Installing the .deb

Download the package file from there: https://github.com/awesometic/realtek-r8125-dkms/releases/download/9.003.05-1/realtek-r8125-dkms_9.003.05-1_amd64.deb Wait for the download to complete and then go to your Downloads folder. If you are using a Debian-based distribution that includes the GUI for installing packages, like Ubuntu 20.04 for instance, double-click on the downloaded package and click Install Package in the package window that just opened, and install. Using the GUI-based connection settings window, click Add Connection (or equivalent) and configure the NIC(s) at your convenience. If Add connection does not show any Wired Connections, reboot and try again. If the connections still do not show up go to the Troubleshooting section.

Manual Installation

In a terminal console type the following commands:

```
$ cd ~/Downloads
$ wget https://github.com/awesometic/realtek-r8125-dkms/archive/master.zip -O realtek-8125-dkms.zip
$ unzip realtek-r8125-dkms-master.zip
$ cd realtek-r8125-dkms-master/
$ sudo ./autorun.sh
```

If you do not want to use wget use whatever command you prefer (i.e git clone). After executing these commands, you should have the NIC available for configuration using the Network Manager or equivalent. If you want to know what the autorun.sh does before executing it, just open it in your favorite text editor (vim, pluma, nano, etc.) You can also find the REALTEK_README.txt into the folder providing additional information. Troubleshooting This section provides tips and tricks to troubleshoot your Linux configuration.

Are you actually using an ODRROID-H2+?

This one is for users owning both H2 and H2+ and installing in the middle night without food or coffee

The two models have essentially the same looking board. A good trick is to put a sticker somewhere, i.e. on the top of a RJ45 plug to distinguish them. Other a quick way when running it is to use `lspci` to make the distinction: On H2+:

```
$ lspci | grep -i realtek
02:00.0 Ethernet controller: Realtek
Semiconductor Co., Ltd. RTL8125 2.5GbE
Controller (rev 04)
03:00.0 Ethernet controller: Realtek
Semiconductor Co., Ltd. RTL8125 2.5GbE
Controller (rev 04)
```

On H2:

```
$ lspci | grep -i realtek
02:00.0 Ethernet controller: Realtek
Semiconductor Co., Ltd. RTL8111/8168/8411 PCI
Express Gigabit Ethernet Controller (rev 0c)
03:00.0 Ethernet controller: Realtek
Semiconductor Co., Ltd. RTL8111/8168/8411 PCI
Express Gigabit Ethernet Controller (rev 0c)
```

How to check that the two NIC are “known” to the Network Manager?

You can use `ip a`:

```
$ ip a
1: lo: <LOOPBACK,UP,LOWER_UP> mtu 65536 qdisc
noqueue state UNKNOWN group default qlen 1000
    link/loopback 00:00:00:00:00:00 brd
00:00:00:00:00:00
    inet 127.0.0.1/8 scope host lo
        valid_lft forever preferred_lft forever
    inet6 ::1/128 scope host
        valid_lft forever preferred_lft forever
2: enp2s0: <NO-CARRIER,BROADCAST,MULTICAST,UP>
mtu 1500 qdisc fq_codel state DOWN group
default qlen 1000
    link/ether 00:e0:4c:68:00:09 brd
ff:ff:ff:ff:ff:ff
    inet 192.168.1.161/24 brd 192.168.1.255
scope global dynamic noprefixroute enp2s0
    valid_lft 86370sec preferred_lft 86370sec
    inet6 fe80::39fe:8b36:f3ec:fe24/64 scope
link noprefixroute
    valid_lft forever preferred_lft forever
3: enp3s0: <NO-CARRIER,BROADCAST,MULTICAST,UP>
mtu 1500 qdisc fq_codel state DOWN group
default qlen 1000
```

```
link/ether 00:e0:4c:68:00:0a brd
ff:ff:ff:ff:ff:ff
```

In the listing above, the first NIC appears as `enp2s0`, its links are up and it is configured with a static IP. The second NIC is not currently connected.

What do I do if the NIC does not show up after installing the driver?

Check whether or not the `r8125` module is loaded using `lsmod`:

```
$ lsmod | grep r8
r8125                147456  0
r8169                90112  0
```

If the line `r8125` does not show up, try to load it with `modprobe`:

```
$ modprobe r8125
```

If no error is reported, the module should be loaded, call `lsmod | grep r8` again to double check. In theory, you only have to do so once.

If errors are reported then it all depends on the nature of error and if you are stuck, your best bet is Google or Bing, and then if still stuck your next step is the ODROID forums or any good Linux forums.

How do I configure the two NIC?

You can use the Settings / Network or Connections GUI window. You can also use the console ncurses-based `nmtui` (google or bing for “`nmtui` howto”). How do I check that a H2+ NIC is configured to 2.5 GbE?

One way it to use `ethtool`:

```
$ sudo apt install ethtool
.../...

$ ethtool enp2s0
Settings for enp2s0:
    Supported ports: [ TP ]
    Supported link modes:   10baseT/Half
10baseT/Full
                                100baseT/Half
100baseT/Full
                                1000baseT/Full
                                2500baseX/Full
    Supported pause frame use: Symmetric
```

```

Receive-only
  Supports auto-negotiation: Yes
  Supported FEC modes: Not reported
  Advertised link modes: 10baseT/Half
10baseT/Full
                        100baseT/Half
100baseT/Full
                        1000baseT/Full
                        2500baseX/Full
  Advertised pause frame use: Symmetric
Receive-only
  Advertised auto-negotiation: Yes
  Advertised FEC modes: Not reported
  Speed: 2500Mb/s
  Duplex: Full
  Port: Twisted Pair
  PHYAD: 0
  Transceiver: internal
  Auto-negotiation: on
  MDI-X: Unknown
Cannot get wake-on-lan settings: Operation not
permitted
  Current message level: 0x00000033 (51)
                        drv probe ifdown ifup
  Link detected: yes

```

Installing without Internet

You can manually install the `realtek-r8125 DKMS` without an Internet connection at the time of installation. Follow these steps right after the OS has been installed. Using the USB installation media as a apt repository

Since there's no Internet after installing the OS, you can't fetch the remote repositories. But you can use the contents of the installation media as a package repository so that you can install the necessary packages. Once you insert again the USB installation media, it will mount that under `/media/user-name` directory. You need to unmount that and mount again to the `/media/cdrom` directory.

```

$ umount /media/user-name/Ubuntu*
$ sudo mkdir /media/cdrom

```

The installation media is not recognized by the specific device node every time. So to mount the proper block device where your installation media, enter the following command.

```

$ sudo mount $(sudo fdisk -l | grep "0 Empty"
| awk '{ print $1 }') /media/cdrom

```

Check if the correct partition is mounted.

```

$ df -Th | grep cdrom
/dev/sdd1    iso9660    2.6G  2.6G   0 100%
/media/cdrom

```

Check that `iso9660` string exists.

Then set the mounted partition as an apt repository.

```

$ sudo apt-cdrom add -d /media/cdrom -m

```

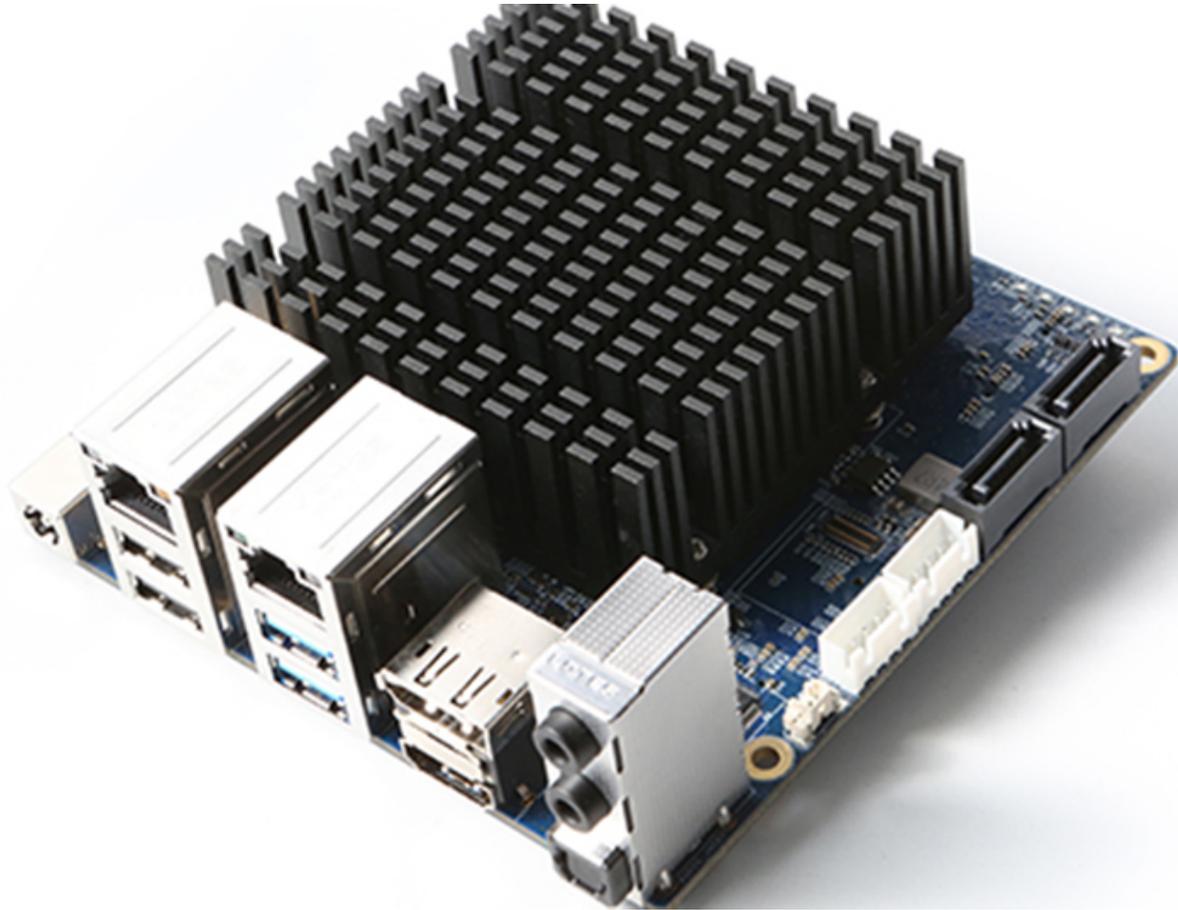
```

Using CD-ROM mount point /media/cdrom/
Identifying...
[262d29a6a66e8f1bebc790a773ce80ec-2]
Scanning disc for index files...
Found 4 package indexes, 0 source indexes, 0
translation indexes and 1 signatures
This disc is called:
'Ubuntu 20.04 LTS _Focal Fossa_ - Release
amd64 (20200423) '
Copying package lists...gpgv: Signature made -
--- -- -- (-)
gpgv:                using RSA key
D94AA3F0EFE21092
gpgv: Good signature from "Ubuntu CD Image
Automatic Signing Key (2012)
<cdimage@ubuntu.com>"
Reading Package Indexes... Done
Writing new source list
Source list entries for this disc are:
deb cdrom:[Ubuntu 20.04 LTS _Focal Fossa_ -
Release amd64 (20200423)]/ focal main
restricted
Repeat this process for the rest of the CDs in
your set.

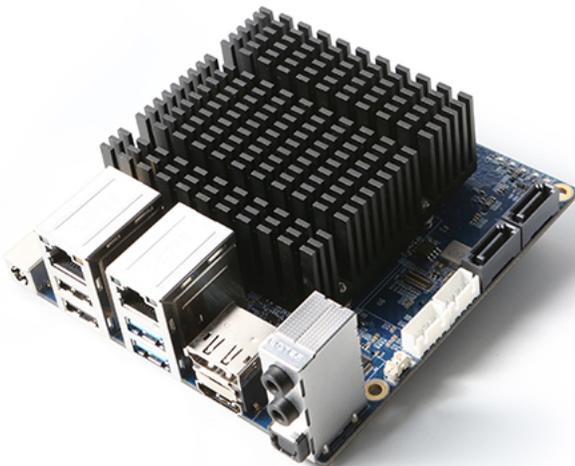
```

ODROID-H2+: The New And Enhanced X86 Platform

© July 1, 2020 By Justin Lee ↗ ODROID-H2+



The ODROID-H2 is back, this time in a slightly upgraded form - named aptly, the ODROID-H2+! Accordingly the board revision code is REV-B+ (while the previous production batch was REV-B).



[Fig. 01]

We announced the original ODROID-H2 back in November 2018, as a new generation of single board computer (SBC) - an x86 device. Despite its success we

could not ship enough of them to satisfy the demand, caused due to the supply shortage of the Intel Gemini Lake J4105 CPU.

Fortunately, early this year, Intel started offering a slightly upgraded CPU, the Celeron J4115 for small manufacturers like us. We therefore expect that most of the existing parts supply problems will be resolved. Some specs can be found at <https://bit.ly/2BXZHTb>.

In addition to the CPU upgrade, we incorporated an enhanced Ethernet controller and RJ45 jacks, to support a much faster 2.5 GbE network. It employs a new NIC built around the RTL8125B chipset. However, for the moment, it requires users to manually install the relevant driver, since the upstream kernel still does not have the needed patch.

We have also increased the number of GPIO pins from 20 to 24 to add USB 2.0 and HDMI CEC signals. If you want to use the CEC function, you will need to buy a 3rd party CEC adapter board, like for instance this one: <https://bit.ly/31NQGaf>.

Finally we also changed the 12V SATA power circuit to improve the suspend-resume power control sequence of 3.5" HDDs.

Setting aside the differences between the ODROID-H2 and the ODROID_H2+, they are software compatible, with the same board dimensions and overall configuration. Everything you do on the ODROID-H2 from an hardware viewpoint, can be done exactly the same way on the ODROID-H2+, including converting the M.2 NVMe slot to PCIe2 x4 with a 3rd party adapter cable, connecting the H2+ to a 1 Gbe or 2.5 Gbe switch or other SBC or PC NIC, using the GPIO, etc. The ODROID H2+ just happens to offer more!

We expect to manufacture the ODROID H2+ without interruption of the CPU supplies.

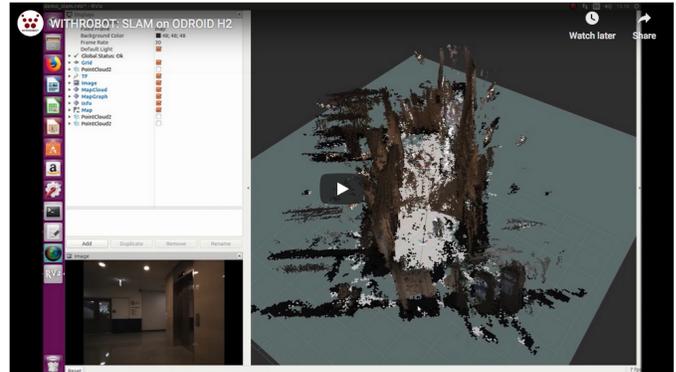
The ODROID H2+ can now be ordered at <https://www.hardkernel.com/shop/odroid-h2plus/>, or other vendors close to your region. The slight price increase, compared to the ODROID-H2, is commensurate with the hardware upgrades and enhanced utility.



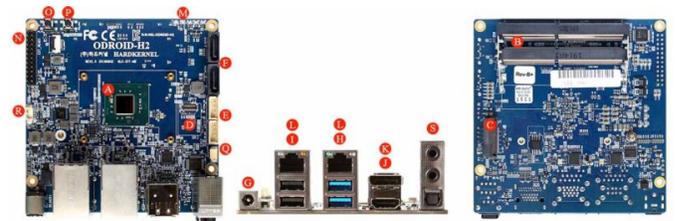
[Fig. 02]



[Fig. 03]



[Fig. 04]



[Fig. 05]

Reference

<https://forum.odroid.com/viewtopic.php?f=168&t=39256>
<https://www.hardkernel.com/shop/odroid-h2plus/>