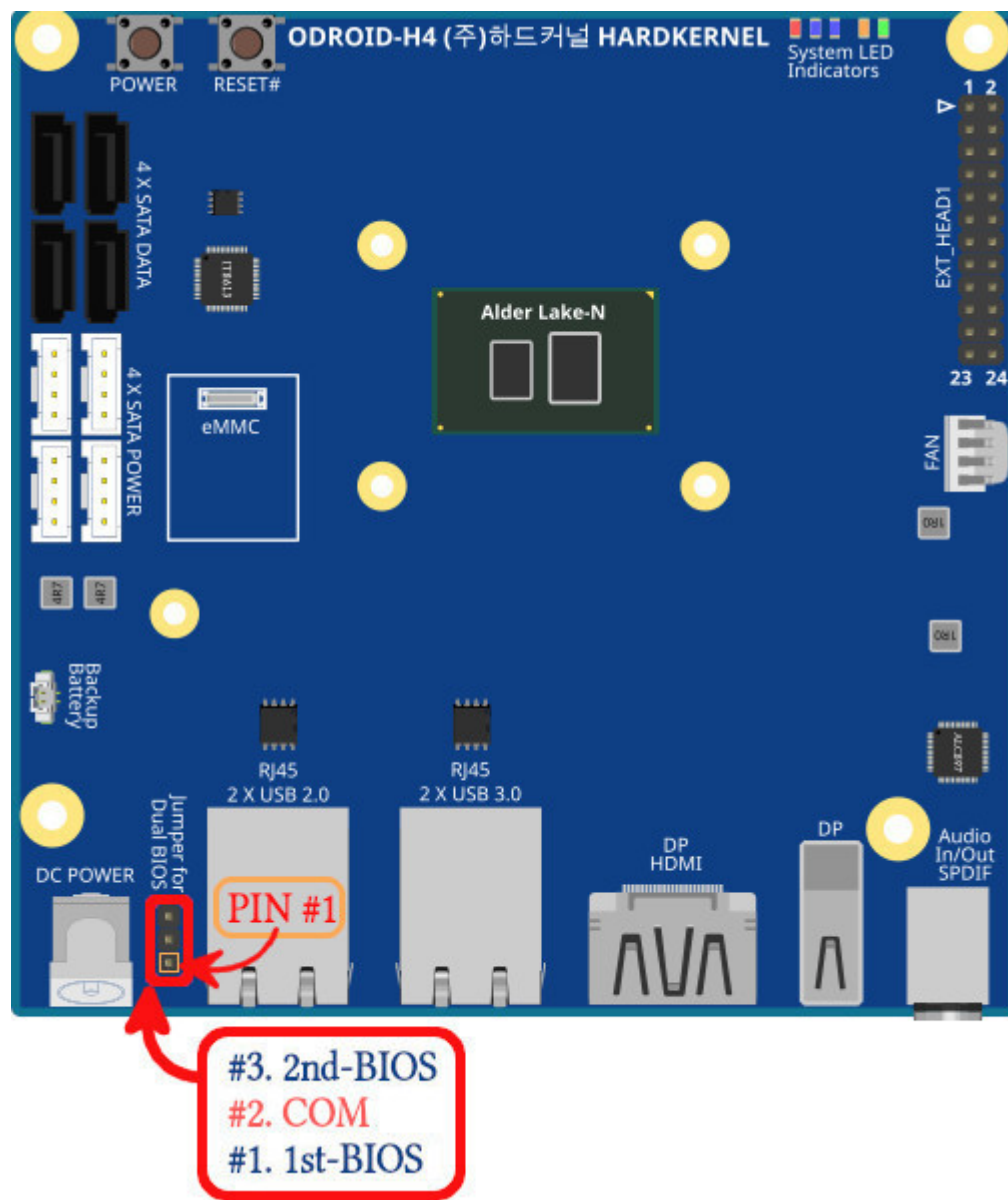


Restore H4 BIOS Firmware

You should know the below lists to proceed to restore.

1. **ODROID-H4+/H4-Ultra** has adapted a **Dual BIOS** feature (**No Dual BIOS feature with ODR0ID-H4 - Howto restore**). When the BIOS fails and is unable to boot, you can move the jumper to the other header pin manually to select a "Backup" BIOS. It will be booted without issue via the "Backup" BIOS and give you a chance to recover the failed BIOS.
2. From the center of the header pin(**COM**-picture below), "Backup" BIOS can be one that by the location of a jumper is either up(1st-BIOS) or down(2nd-BIOS) places. It is up to you which one of both can be "Backup" BIOS. **However, when a jumper pin is not placed in the header pin on any side, the 1st-BIOS will be loaded by design.**
3. The process of restoring BIOS is similar to updating BIOS. You need to get BIOS updating tools in a USB key drive.
4. It can be performed on Windows or an EFI Shell mode as shown below.



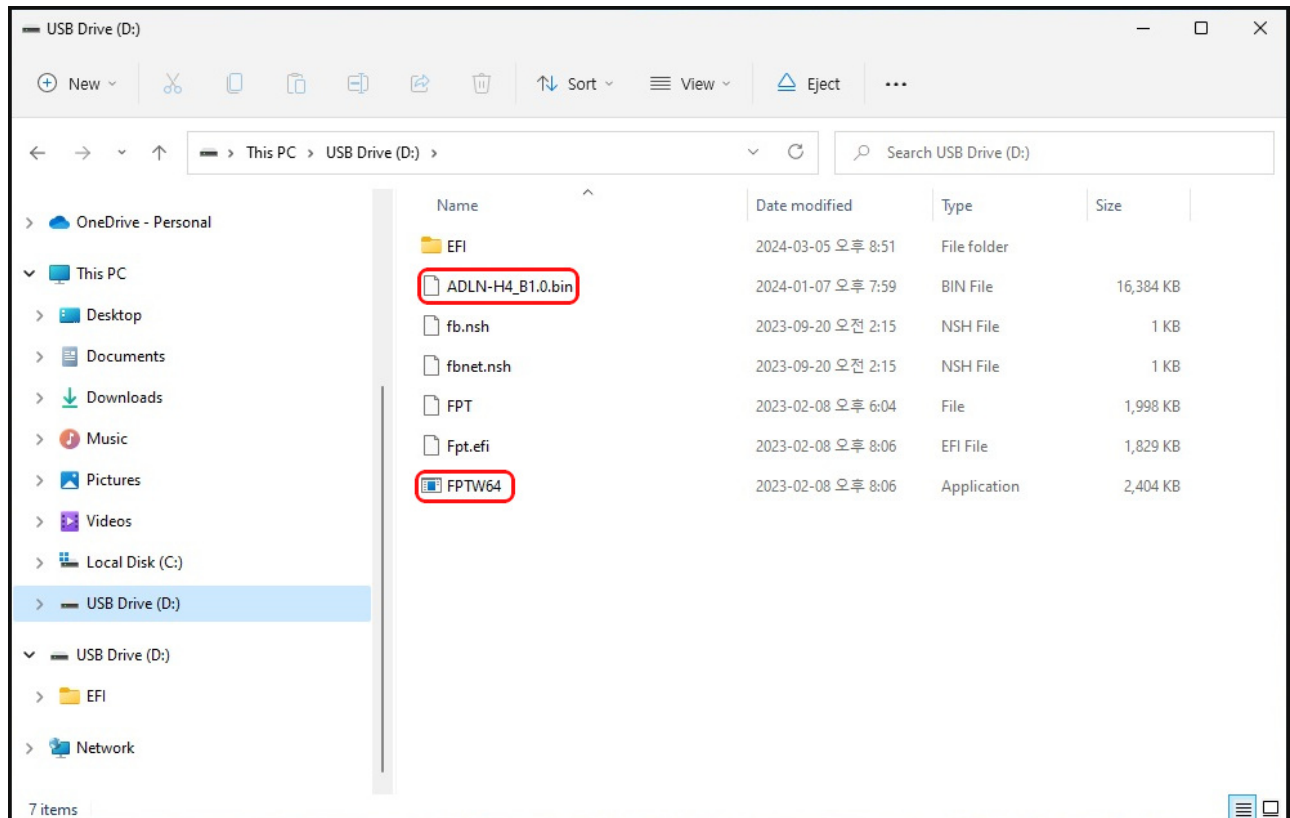
Requirements

The same as BIOS updating tools.

- A USB key drive
- [BIOS F/w and update tools](#)

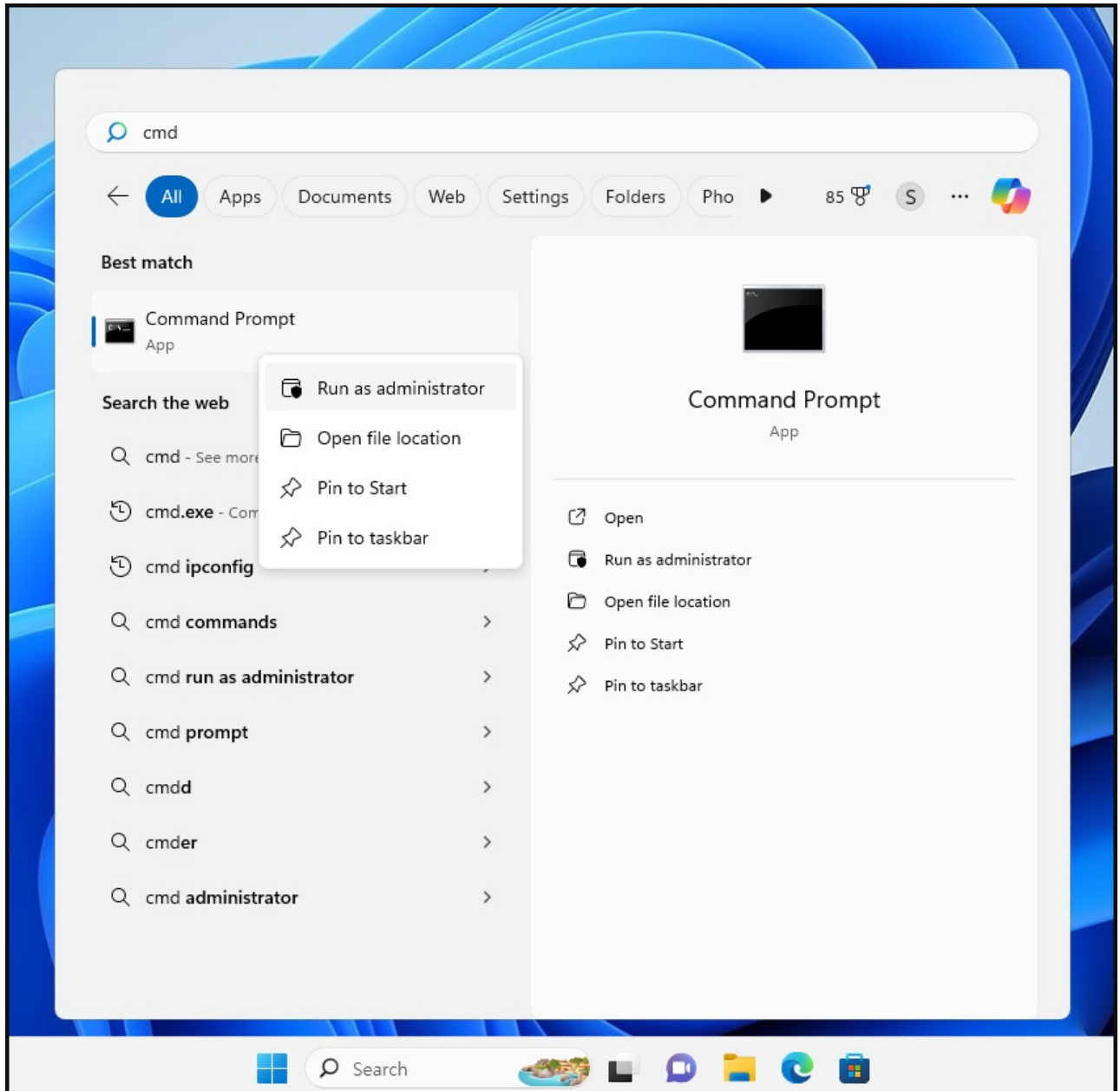
On Windows

- **Step 0.** Power off, set a jumper to “Backup” BIOS on the Header pin, and, power on
- **Step 1.** Booting Windows OS
Windows OS booting, put a USB key drive to any USB port on ODROID-H4, and check the USB drive. Two files in red rounds will be used as below picture.



- **Step 2. Run Command Prompt as administrator**

Hit the windows key + E key, type `cmd`, Windows shows *Best match* on top, move on mouse pointer on it, click the right button on a mouse, and, showed *Run as administrator*. Run it.



- **Step 3. Make disable ME**

Go to location where FPT(Flash Programming Tool) file in there and run **FPTW64.exe -disableme**

```
Administrator: Command Prompt
Microsoft Windows [Version 10.0.22000.2538]
(c) Microsoft Corporation. All rights reserved.

C:\Windows\system32>cd:
D:\>dir/w
Volume in drive D has no label.
Volume Serial Number is 8ACD-A306

Directory of D:\

[EFI]          FPTW64.exe          ADLN-H4_B1.0.bin  fb.nsh          fbnet.nsh       FPT
Fpt.efi        6 File(s)          23,156,090 bytes
               1 Dir(s)          7,906,775,040 bytes free

D:\>FPTW64.exe -disableme
Intel (R) Flash Programming Tool Version: 16.50.0.1292
Copyright (C) 2005 - 2023, Intel Corporation. All rights reserved.

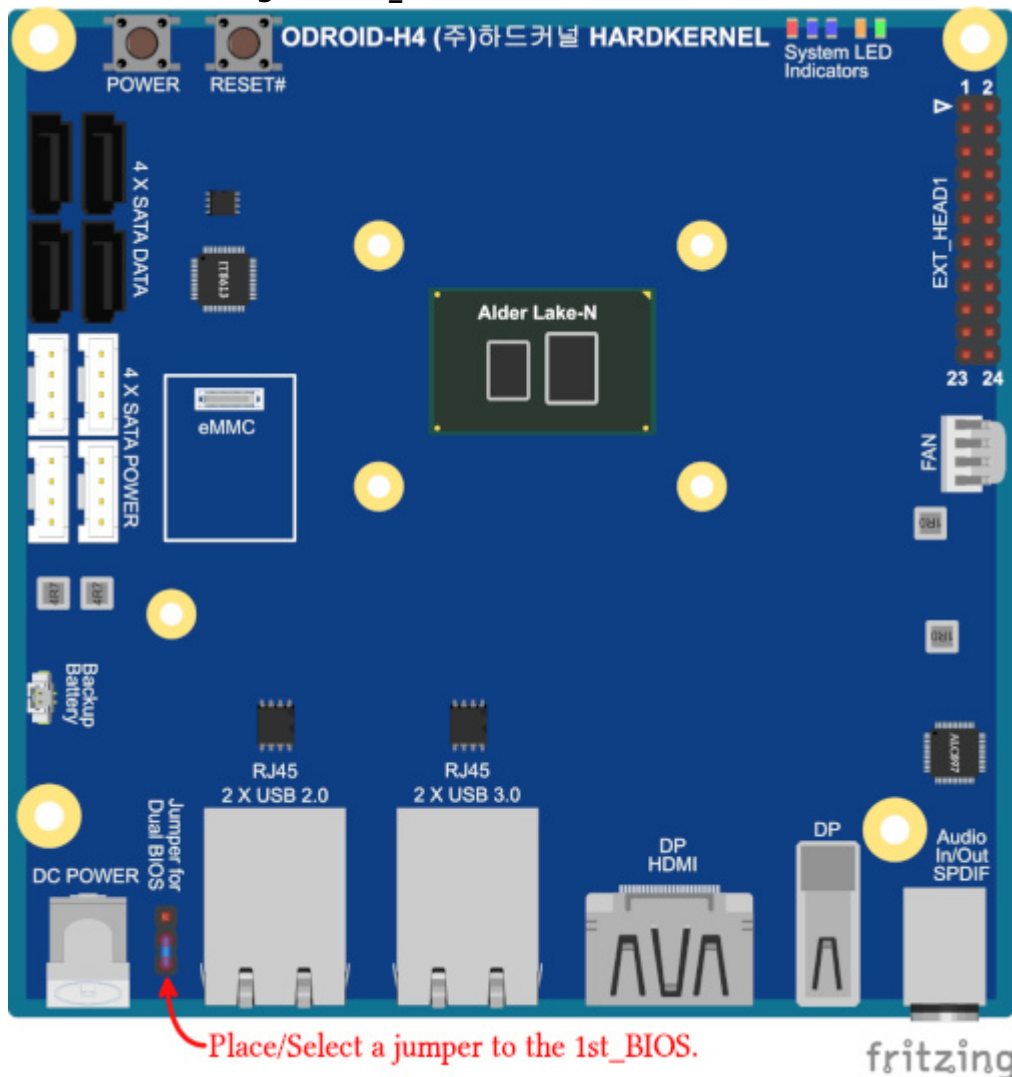
The ME is disabled.

FPT Operation Successful.
```

- **Step 4. Change to failed BIOS by moving a jumper**

Move a jumper to select the failed BIOS.

In the image below, the 1st_BIOS will be restored. (No jumper pin on the header pin is the same as selecting the 1st_BIOS)



- **Step 5. Writing a firmware to the failed BIOS**

Type `FPTW64.exe -f ADLN-H4_B1.0.bin` (in this case the firmware file is ADLN-H4_B1.0.bin) then, hit the enter key will be started to restore the BIOS.

It is the same step as writing firmware to the SPI-ROM when you are updating BIOS.


```

D:\>FPTW64.exe -f ADLN-H4_B1.0.bin
Intel (R) Flash Programming Tool Version: 16.50.0.1292
Copyright (C) 2005 - 2023, Intel Corporation. All rights reserved.

Reading HSFSTS register... Flash Descriptor: Valid

--- Flash Devices Found ---
ID:0xEF7018   Size: 16384KB (131072Kb)

GbE Region does not exist.

Processing Flash memory block    0 from 4095.
- Erasing Flash Block [0x001000] - 100 percent complete.
- Programming Flash [0x0001000] 4KB of 4KB - 100 percent complete.
Processing Flash memory block  408 from 4095.
- Erasing Flash Block [0x199000] - 100 percent complete.
- Programming Flash [0x0199000] 4KB of 4KB - 100 percent complete.
Processing Flash memory block  472 from 4095.
- Erasing Flash Block [0x1D9000] - 100 percent complete.
- Programming Flash [0x01D9000] 96KB of 96KB - 100 percent complete.
Processing Flash memory block  550 from 4095.
- Erasing Flash Block [0x227000] - 100 percent complete.
- Programming Flash [0x0227000] 16KB of 16KB - 100 percent complete.
Processing Flash memory block  556 from 4095.
- Erasing Flash Block [0x22D000] - 100 percent complete.
- Programming Flash [0x022D000] 8KB of 8KB - 100 percent complete.
Processing Flash memory block  558 from 4095.
- Erasing Flash Block [0x22F000] - 100 percent complete.
- Programming Flash [0x022F000] 4KB of 4KB - 100 percent complete.
Processing Flash memory block  565 from 4095.
- Erasing Flash Block [0x236000] - 100 percent complete.
- Programming Flash [0x0236000] 12KB of 12KB - 100 percent complete.
Processing Flash memory block  577 from 4095.
- Erasing Flash Block [0x242000] - 100 percent complete.
- Programming Flash [0x0242000] 28KB of 28KB - 100 percent complete.
Processing Flash memory block  586 from 4095.
- Erasing Flash Block [0x248000] - 100 percent complete.

```

- **Step 6. Writing has done & Reconnect the power code**

The writing is done with no issue as seen in the green words “FPT Operation Successful”, pull out the power code, wait roughly 5 min, power to the H4 back, and, it will be booted via the restored BIOS.

```

- Erasing Flash Block [0x8A7000] - 100 percent complete.
- Programming Flash [0x08A7000] 276KB of 276KB - 100 percent complete.
Processing Flash memory block  3515 from 4095.
- Erasing Flash Block [0xDB0000] - 100 percent complete.
- Programming Flash [0x0DB0000] 296KB of 296KB - 100 percent complete.
Processing Flash memory block  3974 from 4095.
- Erasing Flash Block [0xF87000] - 100 percent complete.
- Programming Flash [0x0F87000] 8KB of 8KB - 100 percent complete.
Processing Flash memory block  3996 from 4095.
- Erasing Flash Block [0xF9D000] - 100 percent complete.
- Programming Flash [0x0F9D000] 76KB of 76KB - 100 percent complete.
Processing Flash memory block  4038 from 4095.
- Erasing Flash Block [0xFC7000] - 100 percent complete.
- Programming Flash [0x0FC7000] 8KB of 8KB - 100 percent complete.
Processing Flash memory block  4060 from 4095.
- Erasing Flash Block [0xFDD000] - 100 percent complete.
- Programming Flash [0x0FDD000] 76KB of 76KB - 100 percent complete.
- Processed memory blocks 4095 from 4095.
- Verifying Flash [0x1000000] 16384KB of 16384KB - 100 percent complete.
RESULT: The data is identical.

Flash device was programmed. It is recommended to perform
G3 power cycle to complete the flashing process.

FPT Operation Successful.

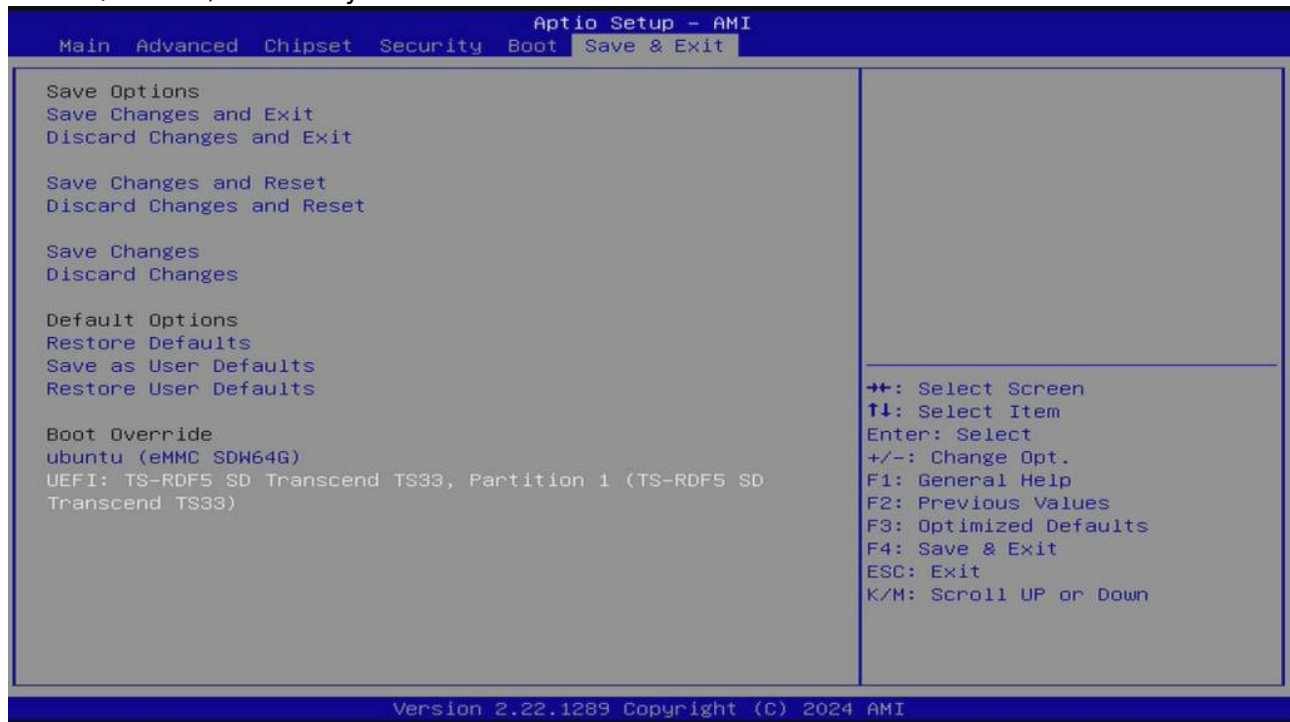
D:\>

```

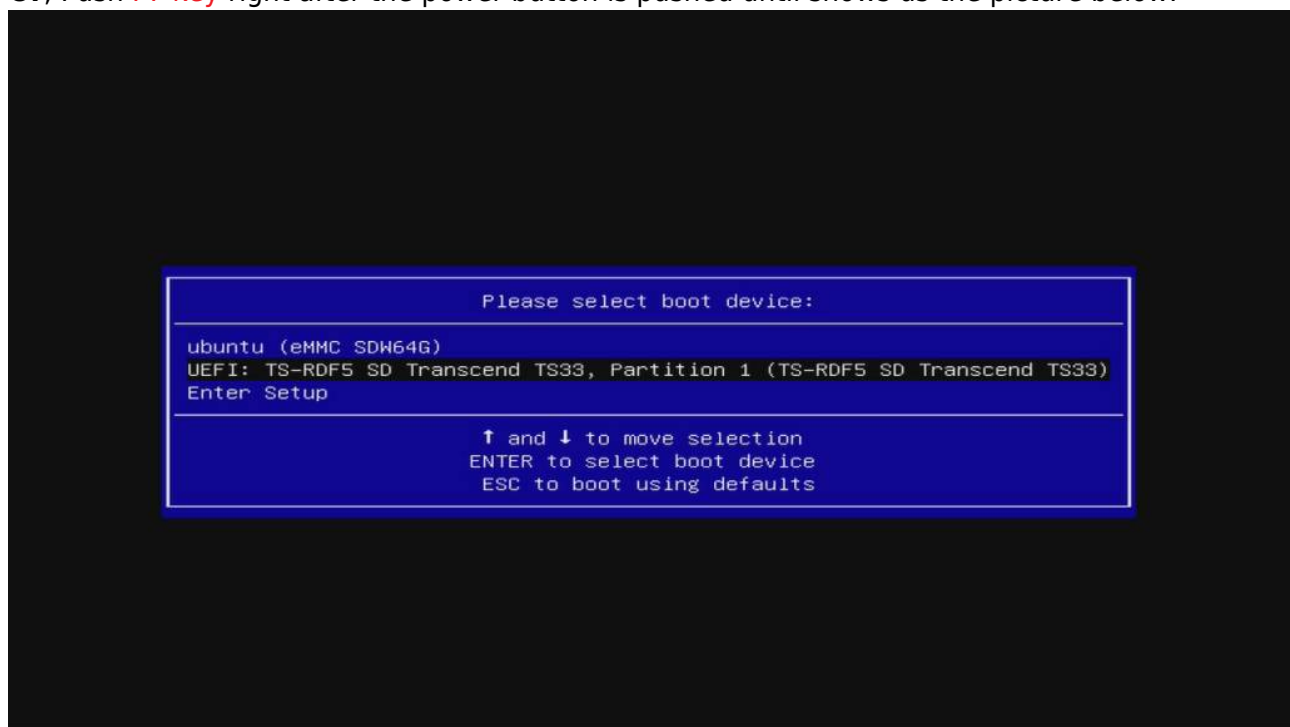
On an EFI Shell

- **Step 0. Power off, put a USB key drive to any USB port on ODROID-H4, set a jumper to “Backup” BIOS on the Header pin, and, power on**
- **Step 1. Boot from a USB key drive**

Enter the BIOS setup menu, move to the Save & Exit tab, you can see the USB key drive, choose/enter it, and now you are in an EFI Shell mode.



Or, Push **F7** key right after the power button is pushed until shows us the picture below.



- **Step 2. Switch to your USB key drive**

In the case of this, **fs1** is removable harddisk. Type **fs1:** and change into your USB key drive.

```

Device mapping table
fs0      :HardDisk - Alias hd20b blk0
          :PciRoot(0x0)/Pci(0x1A,0x0)/eMMC(0x0)/HD(1,GPT,0063B4D3-F3EE-49F4-BAA8
          -BE9466F0BFE4,0x800,0x1E8000)
fs1      :Removable HardDisk - Alias hd15e0b blk1
          :PciRoot(0x0)/Pci(0x14,0x0)/USB(0x4,0x0)/HD(1,GPT,6D0262B5-243C-5041-B
          4EA-3710F6102EB7,0x800,0xECD7C1)
blk0     :HardDisk - Alias hd20b fs0
          :PciRoot(0x0)/Pci(0x1A,0x0)/eMMC(0x0)/HD(1,GPT,0063B4D3-F3EE-49F4-BAA8
          -BE9466F0BFE4,0x800,0x1E8000)
blk1     :Removable HardDisk - Alias hd15e0b fs1
          :PciRoot(0x0)/Pci(0x14,0x0)/USB(0x4,0x0)/HD(1,GPT,6D0262B5-243C-5041-B
          4EA-3710F6102EB7,0x800,0xECD7C1)
blk2     :HardDisk - Alias (null)
          :PciRoot(0x0)/Pci(0x1A,0x0)/eMMC(0x0)/HD(2,GPT,5239844C-6F05-4C26-BBCD
          -464B1DBBF5AC,0x1E8800,0x7293351)
blk3     :BlockDevice - Alias (null)
          :PciRoot(0x0)/Pci(0x1A,0x0)/eMMC(0x0)
blk4     :Removable BlockDevice - Alias (null)
          :PciRoot(0x0)/Pci(0x14,0x0)/USB(0x4,0x0)

Press ESC in 4 seconds to skip startup.nsh, any other key to continue.
Shell> fs1:
fs1:\> _

```

- **Step 3. Make disable ME**

Go to location where FPT(Flash Programming Tool) file in there and run **fpt -disableme**

```

fs1:\H4\ADLN-H4_B1.0\BIOS> ls
Directory of: fs1:\H4\ADLN-H4_B1.0\BIOS

01/16/24  09:07a <DIR>          4,096 .
01/16/24  09:07a <DIR>          4,096 ..
01/08/24  12:59p             16,777,216 ADLN-H4_B1.0.bin
09/20/23  06:15p              29 fb.nsh
09/20/23  06:15p              37 fbnet.nsh
02/09/23  11:04a           2,045,256 FPT
02/09/23  01:06p           1,872,832 Fpt.efi
02/09/23  01:06p           2,460,720 FPTW64.exe
        6 File(s) 23,156,090 bytes
        2 Dir(s)

fs1:\H4\ADLN-H4_B1.0\BIOS> fpt -disableme
Intel (R) Flash Programming Tool Version: 16.50.0.1292
Copyright (C) 2005 - 2023, Intel Corporation. All rights reserved.

The ME is disabled.

FPT Operation Successful.

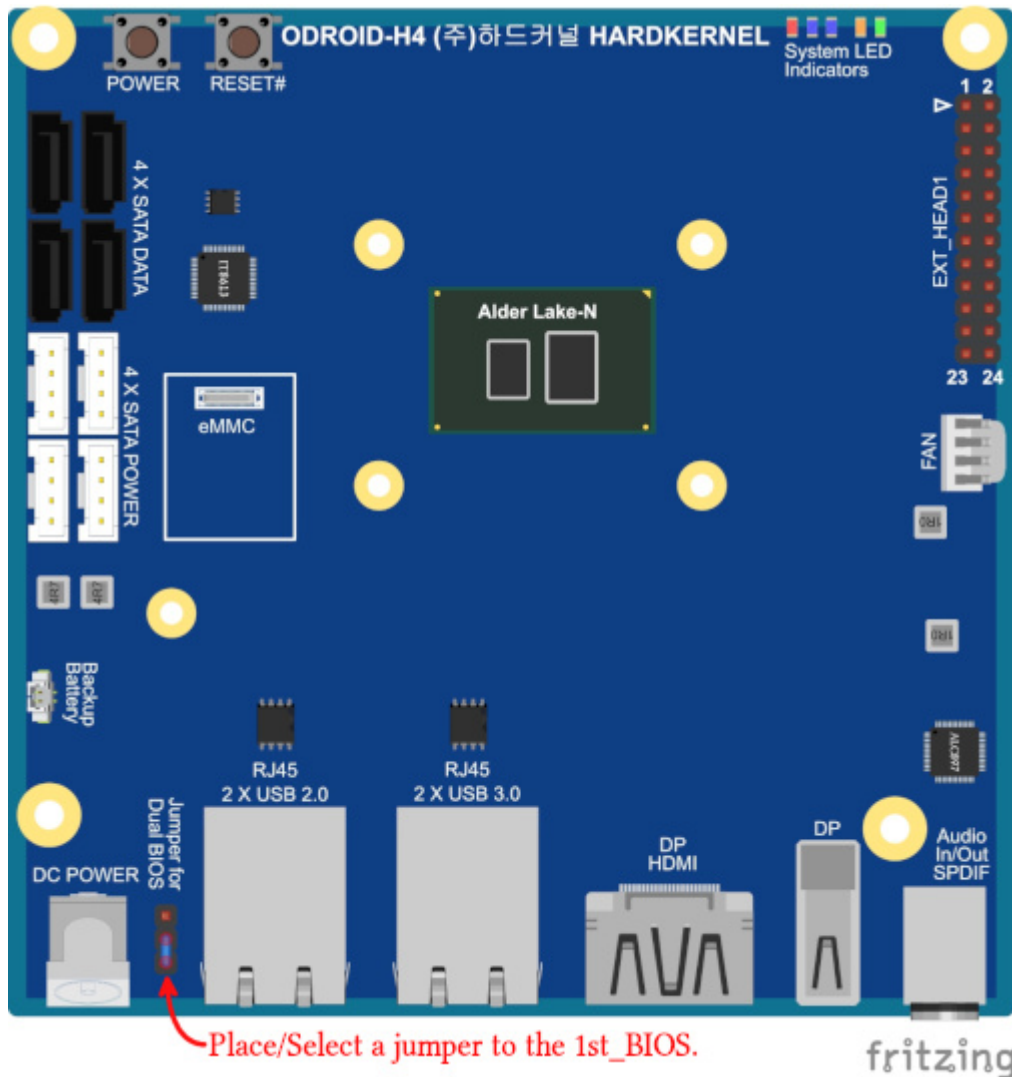
fs1:\H4\ADLN-H4_B1.0\BIOS> _

```

- **Step 4. Change to failed BIOS by moving a jumper**

Move a jumper to select the failed BIOS.

In the image below, the 1st_BIOS will be restored. (No jumper pin on the header pin is the same as selecting the 1st_BIOS)



- **Step 5. Writing a firmware to the failed BIOS**

Restore the BIOS you want. It is the same step as writing firmware to the SPI-ROM when you are updating BIOS.

```

b1k1:\H4\ADLN-H4_B1.0\BIOS> fb
fb> Fpt.efi -f ADLN-H4_B1.0.bin
Intel (R) Flash Programming Tool Version: 16.50.0.1292
Copyright (C) 2005 - 2023, Intel Corporation. All rights reserved.

Reading HSFSTS register... Flash Descriptor: Valid

--- Flash Devices Found ---
ID:0xEF7018   Size: 16384KB (131072Kb)

GbE Region does not exist.

Processing Flash memory block 408 from 4095.
- Erasing Flash Block [0x199000] - 100 percent complete.
- Programming Flash [0x0199000] 4KB of 4KB - 100 percent complete.
Processing Flash memory block 586 from 4095.
- Erasing Flash Block [0x24B000] - 100 percent complete.
- Programming Flash [0x024B000] 4KB of 4KB - 100 percent complete.
Processing Flash memory block 1538 from 4095.
- Erasing Flash Block [0x603000] - 100 percent complete.
- Programming Flash [0x0603000] 12KB of 12KB - 100 percent complete.
Processing Flash memory block 2364 from 4095.
- Erasing Flash Block [0x93D000] - 100 percent complete.
- Programming Flash [0x093D000] 2808KB of 2808KB - 100 percent complete.
= Processed memory blocks 2442 from 4095.
  
```

- **Step 6. Writing has done & Reconnect the power code**

The writing is done with no issue as seen in the green words "FPT Operation Successful", pull out the power code, wait roughly 5 min, power to the H4 back, and, it will be booted via the restored BIOS.

```
- Erasing Flash Block [0x23F000] - 100 percent complete.
- Programming Flash [0x023F000] 16KB of 16KB - 100 percent complete.
Processing Flash memory block 1536 from 4095.
- Erasing Flash Block [0x601000] - 100 percent complete.
- Programming Flash [0x0601000] 4KB of 4KB - 100 percent complete.
Processing Flash memory block 1576 from 4095.
- Erasing Flash Block [0x629000] - 100 percent complete.
- Programming Flash [0x0629000] 156KB of 156KB - 100 percent complete.
Processing Flash memory block 1624 from 4095.
- Erasing Flash Block [0x659000] - 100 percent complete.
- Programming Flash [0x0659000] 168KB of 168KB - 100 percent complete.
Processing Flash memory block 1631 from 4095.
- Erasing Flash Block [0x660000] - 100 percent complete.
- Programming Flash [0x0660000] 4KB of 4KB - 100 percent complete.
- Processed memory blocks 4095 from 4095.
- Verifying Flash [0x1000000] 16388KB of 16384KB - 100 percent complete.
RESULT: The data is identical.

Flash device was programmed. It is recommended to perform
G3 power cycle to complete the flashing process.

FPT Operation Successful.

fs1:\H4\ADLN-H4_B1.0\BIOS> _
```

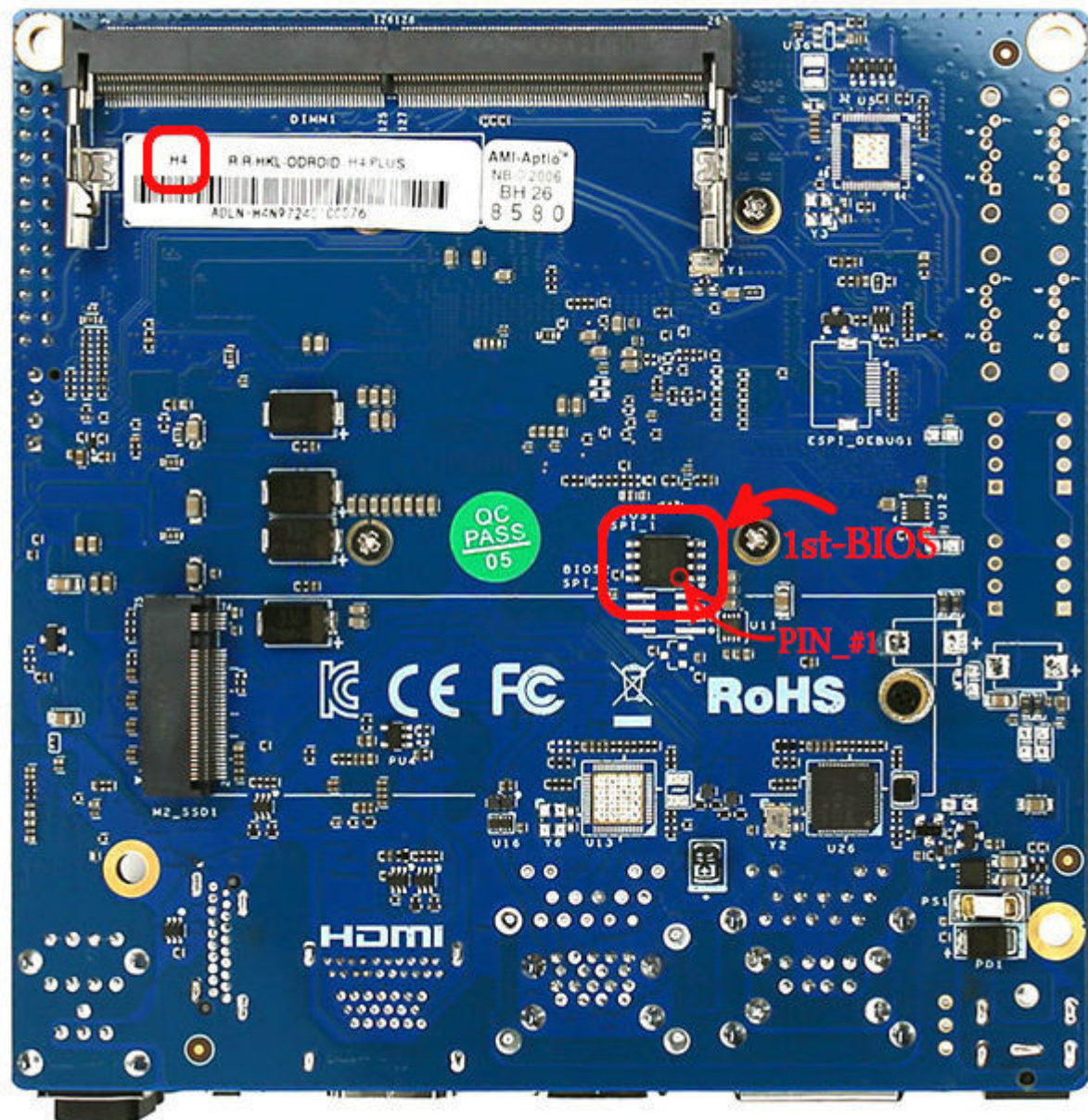
Using tool and soldering skills



In this step, it requires soldering skills and tools. It means that it would be possible to damage ODROID-H4 hardware-wise while you're doing this.

It is the same procedure as restoring H3. but, the location of SPI-ROM is the bottom of the PCB. Check it the below picture.

Please read carefully here in restoring H3. ▀ [Go to the link.](#)



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