

MOCHABINPCBA V1-5-Quick Start Guide

Revision History

Date	Revision	Board Rev	Description
Jan 29, 2020	Rev 01	V0-0-0	
Nov 25, 2022	Rev 02	V1-5	
Jul 11, 2025			Apply for FCC

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A. Appearance

A-1. Enclosure (Mochabin Box)



A-2. MochabinPCBA



B. Package contents

	Content List	Qti	Std/ Opt	Remark
1	MOCHABIN BOX (MOCHABIN PCBA)	1 unit	standard	*1
2	AC to DC 12V Power Adapter	1 pc	standard	Input 100-240VAC ~50/60Hz/ output 12V,3A DC (optional)
3	Micro USB to USB type-A cable	1 pc	optional	For debug console use
4	Warranty card	1 pc	standard	

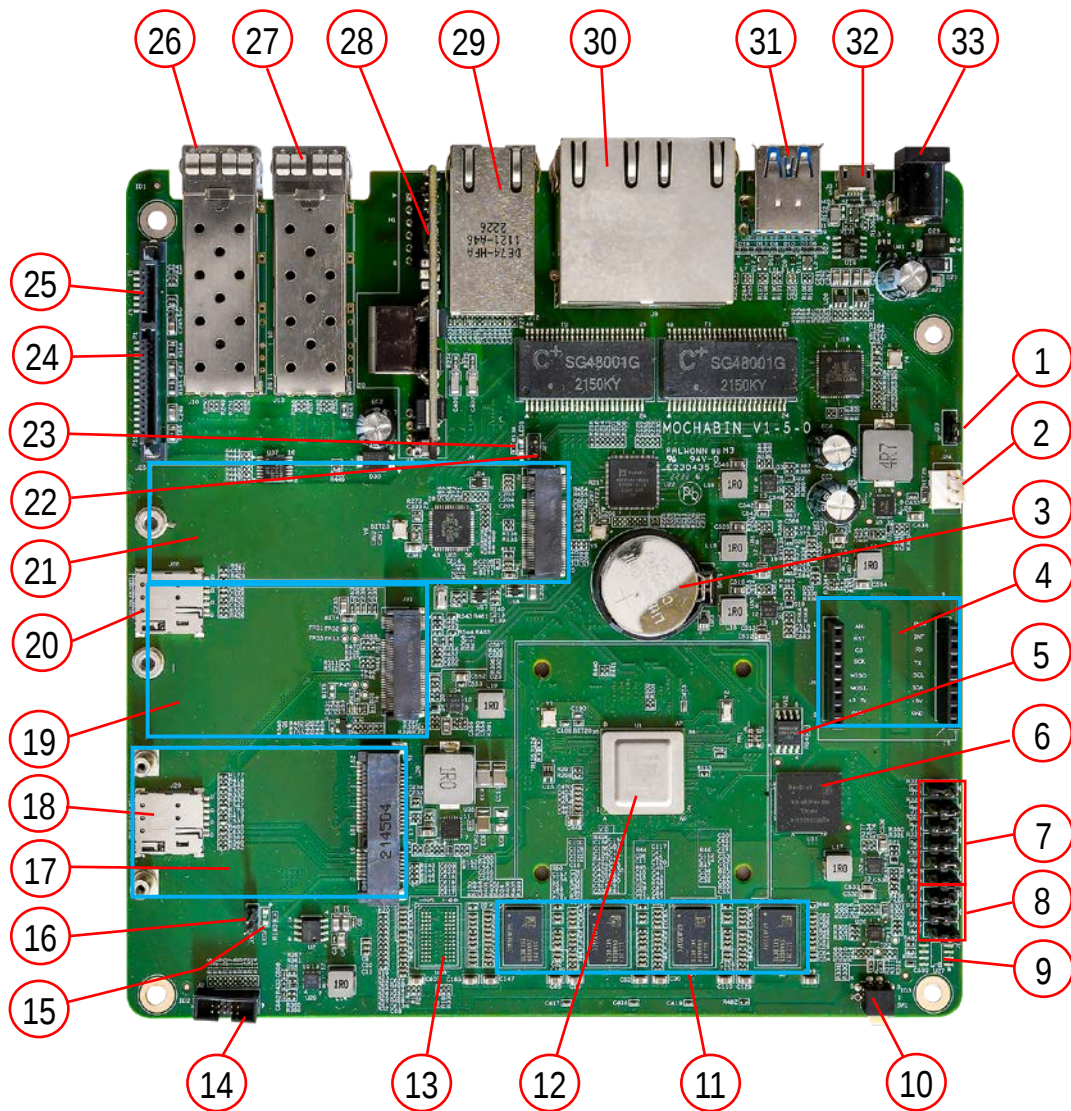
Note *1: There are two SKUs, they are MOCHABIN BOX and MOCHABIN PCBA

C. Key Features

SoC	• Marvell ARMADA7040 • Quad Core ARMv8 Cortex-A72 • CPU frequency @1400MHz
Memory	• 4GB DDR4
Storage	• 4MB SPI NOR flash • 16GB eMMC flash
Ethernet	• 1x 10 Gb SFP+, fiber optic sleeve • 1x 1Gb SFP fiber opticsleeve combo with 1Gb RJ45 either of them can be WAN • 1x 1Gb RJ45 POE • 4x 1GB RJ45 LAN
Wireless	• 802.11 ac/ax/ a/b/g/n +BT5.1, mini -PCleor USB module
USB	• 2x USB 3.0 type-A ports
Expansion	• 16-pin (2x8) MikroBus connector • 1x Mini-PCle 3.0 • 1x M.2 B-key 2250, support USB3.0 interface only • 1x M.2 B-key 2280, support USB3.0 and SATA interface
Debugging	• 1x JTAG port, 10-pin • 1x micro USB UART connector
Miscellaneous	• DC 12V PowerJack • Power on/off button • Reset button
LEDs	• 3x tri-color LEDs • 1 power-on LED • Red LED- M.2 SSD drive LED • Red LED- on mini-PCle for WLAN

D. I/O ports on PCBA

E-1. Top side



No	Part location	Name	Description
1	J23	Reset selection (wire jumper)	*see section G-1
2	J24	Fan power	Supply +12V on pin2-3
3	BAT1	CR2032 /3.3V	RTC power
4	J6	Mikrobus socket	For Mikrobus expansion board *see section G-3
5	U12	SPI Serial Flash32M bit	For uboot image
6	U11	eMMC	8GB eMMC for kernel and root-fs
7	J17,J18,J19,J20,J21,J22	Boot option selection	*See section H-2
8	J14,J15,J16	CPU speed selection	*See section H-1
9	U27	Secure chip	Not populated by default
10	SW1	switch	Power on/off switch
11	U3, U4, U5, U6	SDRAM 1 st bank	DDR4 8bit x4
12	U1	SoC-Marvell ARMADA7040	@1400NHZ
13	U38	DDR4 8bit	ECC SDRAM, not populated by default
14	J2	JTAG Debugger	5x2 pins, *see section G-2
15	LED2	WiFi LED for J5	Not populated by default
16	J30	Header for external WiFi LED	Pin1-anode, pin2-cathode
17	J5	Mini-PCle socket	Reserved for Wi-Fi 6 plus BT5.1 Mini-PCle module
18	J29	SIM sleeve	Connects to J5 and J31 *See section G-5
19	J31	M.2-2250 B-key	Reserved for 4G/LTE/5G module
20	J28	SIM sleeve	Connects to J31 *See section G-5
21	J4	M.2-2280-B key socket	Reserved for SSD expansion
22	LED1	SSD LED for J4	Not populated by default
23	J27	Header for external SSD LED	Pin1-anode, pin2-cathode
24	J25(p1-p15)	SATA connector	SATA power
25	J25(S1-S7)	SATA connector	SATA signal

No	Part location	Name	Description
26	J10	SFP+ eth0	10Gb WAN Fiber connector (see note 1)
27	J13	SFP eth2	1Gb WAN Fiber connector (see note 1)
28	M1	PoE module	802.3at/af 30W PoE module, power from J12
29	J12	Gb RJ45 with PoE- eth2	WAN with PoE input (see note 1)
30	J9	J9A, J9B, J9C, J9D	1Gb RJ45 for WANx1 and LANx3
31	J26	Dual ports USB3.0	Dual ports USB3.0 type-A female
32	J3	Micro-USB for debug console	For debug console only
33	J1	+12V DC in	DC Jack 5.5x2.1mm

Note 1:

- 1) J12 and J13 are the same eth2 port with different form factor, either RJ45 or SFP
- 2) J10 is a 10Gb SFP+ eth0 port
- 3) Eth0 and eth2 are network bonded in mode-1(active backup) as the same WAN port with eth2 set to bond-primary. This means eth0 will be active only when eth2 doesn't exist or fails.

position	Description	Picture
17	AW-XM458	

E-2. Back side

No	Part location	Name	Description
34	SW2	Reset switch	
35	LED7	12VDC Power on LED	Green
36	LED6	I2C controlled LED	Tri-color
37	LED5	I2C controlled LED	Tri-color
38	LED4	I2C controlled LED	Tri-color
39	U7, U8, U9, U10	SDRAM 2 nd bank	DDR4 8bit x8
40	U13	DDR4 8bit	ECC SDRAM, not populated by default

E. I/O ports on Enclosure



No	Part location	Name	Description
1	SW1	switch	Power on/off switch
2	LED7	12VDC Power on LED	Green
3	LED6	I2C controlled LED	Tri-color
4	LED5	I2C controlled LED	Tri-color
5	LED4	I2C controlled LED	Tri-color
6	J10	SFP+ eth0	10Gb WAN Fiber connector (see note 1)
7	J13	SFP eth2	1Gb WAN Fiber connector (see note 1)
8	J12	Gb RJ45 with PoE- eth2	WAN with PoE input (see note 1)
9	J9	J9A, J9B, J9C, J9D	1Gb RJ45 for WANx1 and LANx3
10	J26	Dual ports USB3.0	Dual ports USB3.0 type-A female
11	J3	Micro-USB for debug console	For debug console only
12	J1	+12V DC in	DC Jack 5.5x2.1mm

F. User interfaces

G-1. Reset selection J23

1. J23 is preset to 1-2 by default. When reset switch SW2 is pressed, the MRn low signal will be asserted and sent to SoC to start the system reset process.
2. When J23 is set to 2-3, the KEY_RST will be low when SW2 is pressed and then sent to SOC GPIO mpp11, code must be pre-programmed by the user for responding.

G-2. J2- JTAG debugger Pin definition

Pin#	Signal	Remark	Pin#	Signal	Remark
1	+3.3V	Not applied with R115 not populated	2	JT_TMS	
3	APUART_RXD	NC with R121 not populated	4	JT_CLK	
5	GND		6	JT_TDO	
7	APUART_TXD	NC with R122 not populated	8	JT_TDI	
9	JT_TRSTn	NC with R123 not populated	10	JT_RESETh	

G-3. J6-Mikrobus- Pin definition

Pin#	Signal	Remark		Pin#	Signal	Remark
1	NC	AN		9	MKR_PWM	MK_PWM
2	MKR_RST	MK_RST		10	MKR_INT	MK_INT
3	SPI0_CSn0	MK_CS		11	UA0_RXD	MK_RX
4	SPI0_SCK	MK_SCK		12	UA0_TXD	MK_TX
5	SPI0_MISO	MK_MISO		13	I2C0_SCL	MK_SCL
6	SPI0_MOSI	MK_MOSI		14	I2C0_SDA	MK_SDA
7	+3.3V	MK_3.3V		15	+5V	MK_5V
8	GND			16	GND	

G-4. J26 Dual USB3.0 cable connector

Pin#	Signal	Remark		Pin#	Signal	Remark
A1	+USB3_1_VCC	+5V		B1	+USB3_2_VCC	+5V
A2	USB3_1_DM			B2	USB3_2_DM	
A3	USB3_1_DP			B3	USB3_2_DP	
A4	GND			B4	GND	
A5	USB3_1_RXn			B5	USB3_2_RXn	
A6	USB3_1_RXp			B6	USB3_2_RXp	
A7	GND			B7	GND	
A8	USB3_1_TXn			B8	USB3_2_TXn	
A9	USB3_1_TXp			B9	USB3_2_TXp	
S1/S2	SGNC			S3/S4	SGNC	

G-5. J28, J29 USIM sleeves

There are two USIM sleeves J28 and J29,

J28 is dedicated to M.2 2250 slot J31 while J29 is shared by J31 and J5 mini PCIe slot.

G. Bootstrap wire jumpers

H-1. CPU Clock – J14, J15, J16

MPP46	MPP17 J16	MPP16 J15	MPP15 J14	HEX value	CPU clock MHz	DDR clock MHz	Remark
H	L(2-3)	H(1-2)	H(1-2)	0xB	1200	800	
H	H(1-2)	L(2-3)	L(2-3)	0XC	1400	800	Default value
H	H(1-2)	L(2-3)	H(1-2)	0XD	600	800	
H	H(1-2)	H(1-2)	L(2-3)	0XE	800	800	
H	H(1-2)	H(1-2)	H(1-2)	0XF	1000	800	

H-2. Boot Mode – J17, J18, J19, J20, J21, J22

BootROM Enabled	
Boot Mode [5:0]	Details
0x0	BootROM Enabled, Boot from NOR: 8 bits width, DEV_Wen,andDEV_OEn are not muxed with DEV_A[16:15], using MPP multiplexing option of NOR 8 bits
0x1	BootROM Enabled, Boot from NOR: 8 bits width, DEV_Wen,andDEV_OEn are muxed with DEV_A[16:15], using MPP multiplexing option of NOR 8 bits
0x4	BootROM Enabled, Boot from NOR: 16 bits width, DEV_Wen,andDEV_OEn are not muxed with DEV_A[16:15], using MPP multiplexing option of NOR 16 bits
0x5	BootROM Enabled, Boot from NOR: 16 bits width, DEV_Wen,andDEV_OEn are muxed with DEV_A[16:15], using MPP multiplexing option of NOR 16 bits
0x8	BootROM Enabled, Boot from NAND: 8 bits width, using MPP multiplexing option of NAND 8 bits

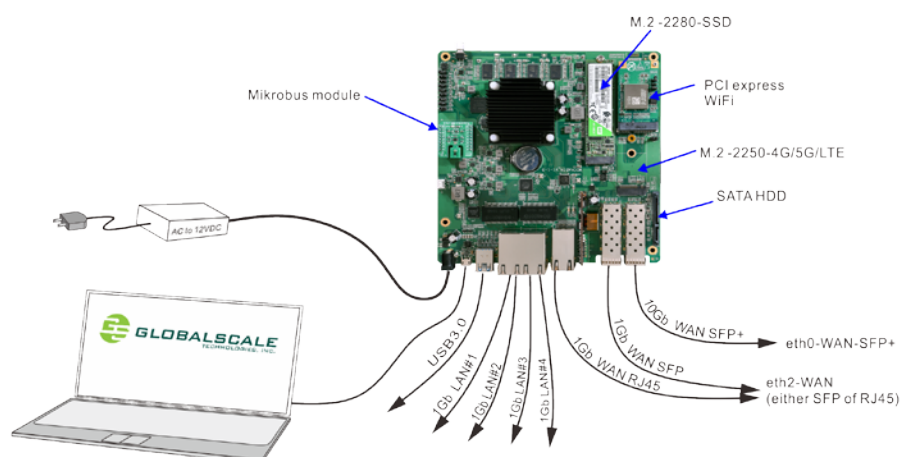
0x9	BootROM Enabled, Boot from NAND: 8 bits width, with a page size of 2KB, 1 bit ECC support per page, using MPP multiplexing option of NAND 8 bits
0x0A	BootROM Enabled, Boot from NAND: 8 bits width, with a page size of 2KB, 4 bits ECC support per page, using MPP multiplexing option of NAND 8 bits
0x0B	BootROM Enabled, Boot from NAND: 8 bits width, with a page size of 2KB, 8 bits ECC support per page, using MPP multiplexing option of NAND 8 bits
0x0C	BootROM Enabled, Boot from NAND: 8 bits width, with a page size of 2KB, 12 bits ECC support per page, using MPP multiplexing option of NAND 8 bits
0x0D	BootROM Enabled, Boot from NAND: 8 bits width, with a page size of 2KB, 16 bits ECC support per page, using MPP multiplexing option of NAND 8 bits
0x0E	BootROM Enabled, Boot from NAND: 8 bits width, with a page size of 4KB, 4 bits ECC support per page, using MPP multiplexing option of NAND 8 bits
0x0F	BootROM Enabled, Boot from NAND: 8 bits width, with a page size of 4KB, 8 bits ECC support per page, using MPP multiplexing option of NAND 8 bits
0x10	BootROM Enabled, Boot from NAND: 8 bits width, with a page size of 4KB, 12 bits ECC support per page, using MPP multiplexing option of NAND 8 bits
0x11	BootROM Enabled, Boot from NAND: 8 bits width, with a page size of 4KB, 16 bits ECC support per page, using MPP multiplexing option of NAND 8 bits
0x12	BootROM Enabled, Boot from NAND: 8 bits width, with a page size of 8KB, 4 bits ECC support per page, using MPP multiplexing option of NAND 8 bits
0x13	BootROM Enabled, Boot from NAND: 8 bits width, with a page size of 8KB, 8 bits ECC support per page, using MPP multiplexing option of NAND 8 bits
0x14	BootROM Enabled, Boot from NAND: 8 bits width, with a page size of 8KB, 12 bits ECC support per page, using MPP multiplexing option of NAND 8 bits
0x15	BootROM Enabled, Boot from NAND: 8 bits width, with a page size of 8KB, 16 bits ECC support per page, using MPP multiplexing option of NAND 8 bits
0x18	BootROM Enabled, Boot from NAND: 16 bits width, using MPP multiplexing option of NAND 16 bits
0x19	BootROM Enabled, Boot from NAND: 16 bits width, with a page size of 2KB, 1 bit ECC support per page, using MPP multiplexing option of NAND 16 bits
0x1A	BootROM Enabled, Boot from NAND: 16 bits width, with a page size of 2KB, 4 bits ECC support per page, using MPP multiplexing option of NAND 16 bits
0x1B	BootROM Enabled, Boot from NAND: 16 bits width, with a page size of 2KB, 8 bits ECC support per page, using MPP multiplexing option of NAND 16 bits
0x1C	BootROM Enabled, Boot from NAND: 16 bits width, with a page size of 2KB, 12 bits ECC support per page, using MPP multiplexing option of NAND 16 bits

0x1D	BootROM Enabled, Boot from NAND: 16 bits width, with a page size of 2KB, 16 bits ECC support per page, using MPP multiplexing option of NAND 16 bits
0x1E	BootROM Enabled, Boot from NAND: 16 bits width, with a page size of 4KB, 4 bits ECC support per page, using MPP multiplexing option of NAND 16 bits
0x1F	BootROM Enabled, Boot from NAND: 16 bits width, with a page size of 4KB, 8 bits ECC support per page, using MPP multiplexing option of NAND 16 bits
0x20	BootROM Enabled, Boot from NAND: 16 bits width, with a page size of 4KB, 12 bits ECC support per page, using MPP multiplexing option of NAND 16 bits
0x21	BootROM Enabled, Boot from NAND: 16 bits width, with a page size of 4KB, 16 bits ECC support per page, using MPP multiplexing option of NAND 16 bits
0x22	BootROM Enabled, Boot from NAND: 16 bits width, with a page size of 8KB, 4 bits ECC support per page, using MPP multiplexing option of NAND 16 bits
0x23	BootROM Enabled, Boot from NAND: 16 bits width, with a page size of 8KB, 8 bits ECC support per page, using MPP multiplexing option of NAND 16 bits
0x24	BootROM Enabled, Boot from NAND: 16 bits width, with a page size of 8KB, 12 bits ECC support per page, using MPP multiplexing option of NAND 16 bits
0x25	BootROM Enabled, Boot from NAND: 16 bits width, with a page size of 8KB, 16 bits ECC support per page, using MPP multiplexing option of NAND 16 bits
0x28	BootROM Enabled, Boot from SD: AP_SD, using MPP multiplexing option of SD on AP_MPP[5:0]
0x29	BootROM Enabled, Boot from SD: CP_SD, using MPP multiplexing option of SD on MPP[61:56]
0x2A	BootROM Enabled, Boot from eMMC: AP_eMMC, using MPP multiplexing option of eMMC on AP_MPP[5:0] sel SDIO PHY.
0x2B	BootROM Enabled, Boot from eMMC: CP_eMMC, using MPP multiplexing option of eMMC on CP MPP[61:56] sel SDIO PHY and CP MPP[34:33] sel 0x2
0x2E	BootROM Enabled, Boot from SPI: CP_SPI1, NAND Flash type, using MPP multiplexing option of SPI on MPP[13:16]
0x2F	BootROM Enabled, Boot from SPI: CP_SPI0, NAND Flash type, using MPP multiplexing option of SPI on MPP[56:59]
0x30	BootROM Enabled, Boot from SPI: AP_SPI, 24 address bits, NOR Flash type, using MPP multiplexing option of SPI on AP_MPP[3:0]
0x32	BootROM Enabled, Boot from SPI: CP_SPI1, 24 address bits, NOR Flash type, using MPP multiplexing option of SPI on MPP[13:16]
0x33	BootROM Enabled, Boot from SPI: CP_SPI1, 32 address bits, NOR Flash type, using MPP multiplexing option of SPI on MPP[13:16]
0x34	BootROM Enabled, Boot from SPI: CP_SPI0, 24 address bits, NOR Flash type, using MPP multiplexing option of SPI on MPP[56:59]

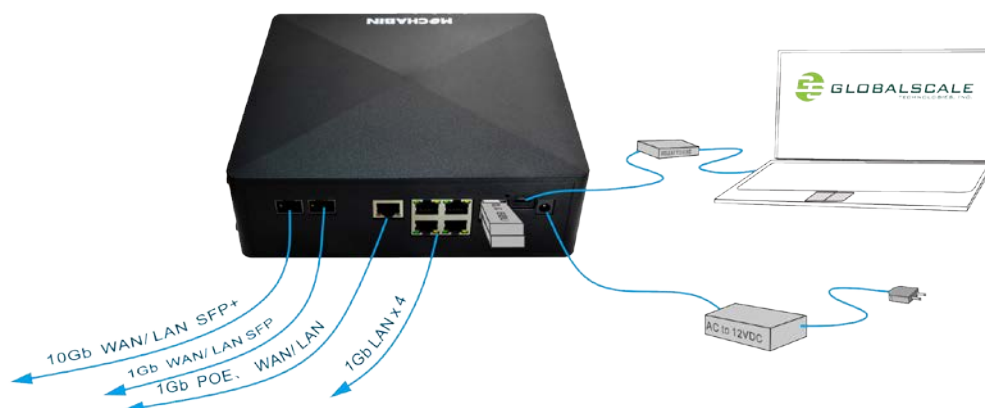
0x35	BootROM Enabled, Boot from SPI: CP_SPI0, 32 address bits, NOR Flash type, using MPP multiplexing option of SPI on MPP[56:59]
------	--

H. Cable connection for testing

J-1. MochabinPCBA connection



J-2. MochabinBOX connection



I. Preparation for power on

K-1. Hardware:

- a. Linux PC installed with minicom, putty or Windows PC installed with putty
- b. MOCHABINunit PCBA or BOX
- c. Ethernet cable from IP router or IP switch (optional)
- d. USB3.0 Flash disks (optional)
- e. Mini-USB to USB cable

K-2. Software:

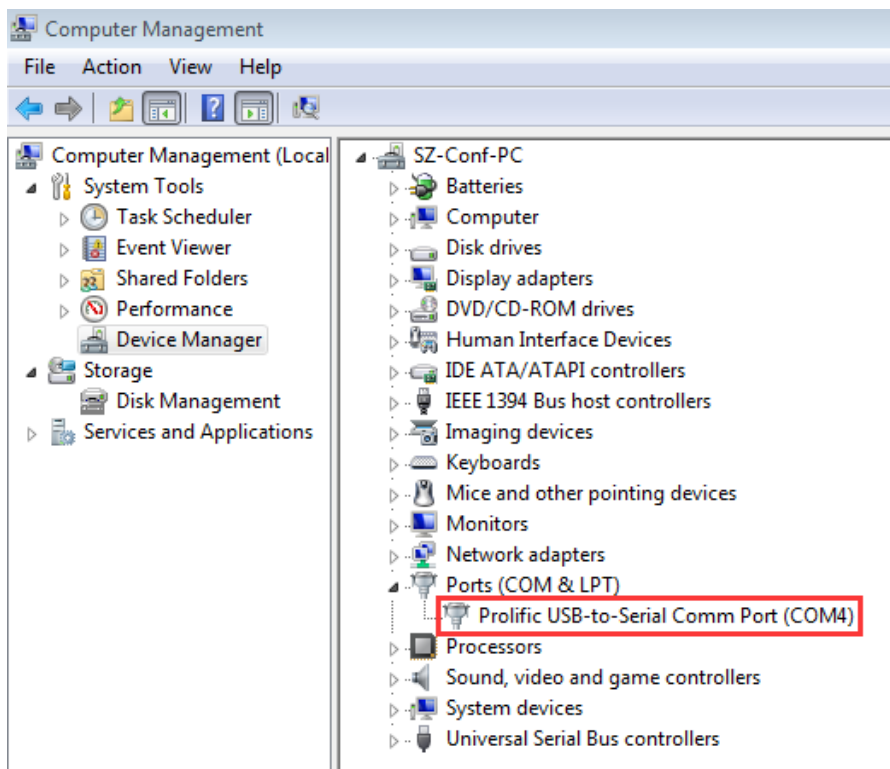
- a. Putty for Linux or Windows PC
Please go on web and download putty.exe

Visit the following web site for more information

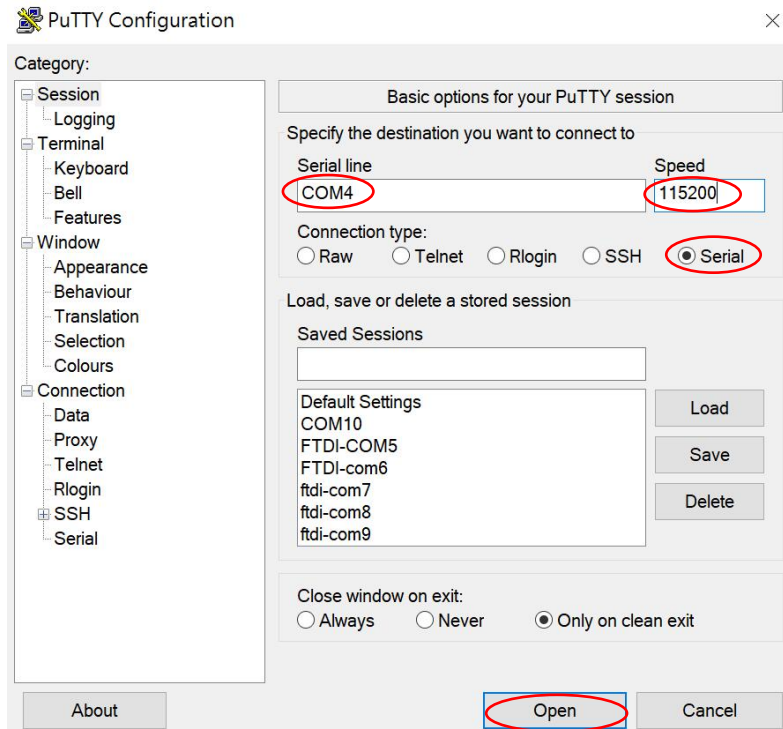
<http://www.globalscaletechnologies.com/t-downloads.aspx>

J. Find com port and connect with putty

1. Connect MOCHABIN's RS-232 port to PC's USB port by using the dedicated cable
2. Go to [my computer] [device manager] and you will see a new COM port after plugging in the USB cable, here is COM4 for example



- Run putty, select serial connection then enter the COM port you've found in the previous step, The baud rate speed is 115200 then press "open"



K. Running MOCHABIN

M-1. Check U-boot version and some system information

Power on the board then press enter to terminate uboot running, you can see messages on screen like the followings

```
U-Boot 2018.03-devel-18.12.3-gb794de0054 (Sep 05 2022 - 14:38:22 +0800)

Model: Marvell Armada7040 Mochabin development board
SoC: Armada7040-B0; AP806-B0; CP115-A0
Clock: CPU      1400 [MHz]
       DDR      800 [MHz]
       FABRIC    800 [MHz]
       MSS      200 [MHz]
LLC Enabled (Exclusive Mode)
DRAM:  4 GiB
Bus spi@700680 CS0 configured for direct access 00000000f9000000:0x1000000
SF: Detected w25q32bv with page size 256 Bytes, erase size 4 KiB, total 4 MiB
Comphy chip #0:
Comphy-0: SGMII1          3.125 Gbps
Comphy-1: USB3_HOST0
Comphy-2: SATA0
Comphy-3: SATA1
Comphy-4: SF10            10.3125 Gbps
Comphy-5: PEX2
UTMI PHY 0 initialized to USB Host0
UTMI PHY 1 initialized to USB Host1
SATA link 0 timeout.
SATA link 1 timeout.
AHCI 0001.0000 32 slots 2 ports 6 Gbps 0x3 impl SATA mode
flags: 64bit ncq led only pmpfbsspio slum part sxs
PCIE-0: Link down
MMC:   sdhci@6e0000: 0
Loading Environment from SPI Flash... OK
Model: Marvell Armada7040 Mochabin development board
Net:   eth0: mvpp2-0 [PRIME], eth1: mvpp2-1, eth2: mvpp2-2
Hit any key to stop autoboot:  0
Marvell>>
```

Enter “boot” to continue boot up if interrupted.

```
Marvell>>
Marvell>> boot
```

M-2. login “root” with password “admin”

```
moca289bf1 login: root
Password:
Last login: Wed Nov 23 13:11:33 UTC 2022 on ttyS0
Welcome to Ubuntu 18.04 LTS (GNU/Linux 5.4.163-00034-ga7e9e3c22288 aarch64)

* Documentation:  https://help.ubuntu.com
* Management:    https://landscape.canonical.com
* Support:        https://ubuntu.com/advantage
root@moca289bf1:~#
```

```
root@moca289bf1:~# whoami
root
root@moca289bf1:~# pwd
/root
root@moca289bf1:~#
```

M-3. Check the kernel version

Enter command :uname-a

```
Linux moca289bf1 5.4.163-00034-ga7e9e3c22288 #2 SMP PREEMPT Fri Aug 5 14:25:28 CST 2022 aarch64
aarch64aarch64 GNU/Linux
root@moca289bf1:~# ^C
root@moca289bf1:~#
```

M-4. Check the CPU information

M-4.1 check with command “cat /proc/cpuinfo”

You may see there are 4 processors

```
root@moca289bf1:~# cat /proc/cpuinfo
processor       : 0
BogoMIPS      : 50.00
Features       : fpasimdevtstrmaespmull sha1 sha2 crc32 cpuid
CPU implementer : 0x41
CPU architecture: 8
CPU variant    : 0x0
CPU part      : 0xd08
CPU revision   : 1

processor       : 1
BogoMIPS      : 50.00
Features       : fpasimdevtstrmaespmull sha1 sha2 crc32 cpuid
CPU implementer : 0x41
CPU architecture: 8
CPU variant    : 0x0
CPU part      : 0xd08
CPU revision   : 1

processor       : 2
BogoMIPS      : 50.00
Features       : fpasimdevtstrmaespmull sha1 sha2 crc32 cpuid
CPU implementer : 0x41
CPU architecture: 8
CPU variant    : 0x0
CPU part      : 0xd08
CPU revision   : 1

processor       : 3
BogoMIPS      : 50.00
Features       : fpasimdevtstrmaespmull sha1 sha2 crc32 cpuid
CPU implementer : 0x41
CPU architecture: 8
CPU variant    : 0x0
CPU part      : 0xd08
CPU revision   : 1

root@moca289bf1:~#
```

M-4.2 check with lscpu command

```
root@moca289bf1:~# lscpu
Architecture:      aarch64
Byte Order:        Little Endian
CPU(s):            4
On-line CPU(s) list: 0-3
Thread(s) per core: 1
Core(s) per socket: 4
Socket(s):         1
NUMA node(s):     1
Vendor ID:         ARM
Model:             1
Model name:        Cortex-A72
Stepping:          r0p1
CPU max MHz:       1400.0000
CPU min MHz:       350.0000
BogoMIPS:          50.00
NUMA node0 CPU(s): 0-3
Flags:             fpasimdevtstrmaespmull sha1 sha2 crc32 cpuid
root@moca289bf1:~#
```

M-5. Check the memory information

```
root@moca289bf1:~# cat /proc/meminfo
MemTotal:          4031096 kB
MemFree:           3843280 kB
MemAvailable:      3821368 kB
Buffers:           5972 kB
Cached:            83540 kB
SwapCached:        0 kB
Active:            50816 kB
Inactive:          56704 kB
Active(anon):      18520 kB
Inactive(anon):    2556 kB
Active(file):      32296 kB
Inactive(file):    54148 kB
Unevictable:       0 kB
Mlocked:           0 kB
SwapTotal:         0 kB
SwapFree:          0 kB
Dirty:             4 kB
Writeback:         0 kB
AnonPages:         18016 kB
Mapped:            24328 kB
Shmem:             3060 kB
KReclaimable:      12432 kB
Slab:              35864 kB
SReclaimable:      12432 kB
SUnreclaim:        23432 kB
KernelStack:       1952 kB
PageTables:        764 kB
NFS_Unstable:      0 kB
Bounce:            0 kB
```

M-6. Check the network information

Connect RJ45 cable from the WAN port to the ethernet router or switch
type in “dhclient” then ifconfig”

M-6.1 checkwith ifconfig command

```
root@moca289bf1:~# ifconfig
bond0: flags=5187<UP, BROADCAST, RUNNING, MASTER, MULTICAST>mtu 1500
inet 192.168.3.21 netmask 255.255.255.0 broadcast 192.168.3.255
    inet6 fe80::f2ad:4eff:fe28:9bf1 prefixlen 64 scopeid 0x20<link>
    ether f0:ad:4e:28:9b:f1 txqueuelen 1000 (Ethernet)
    RX packets 417 bytes 44263 (44.2 KB)
    RX errors 0 dropped 0 overruns 0 frame 0
    TX packets 389 bytes 34702 (34.7 KB)
    TX errors 0 dropped 0 overruns 0 carrier 0 collisions 0

br0: flags=4099<UP, BROADCAST, MULTICAST>mtu 1500
inet 192.168.84.1 netmask 255.255.255.0 broadcast 192.168.84.255
    ether f0:ad:4e:28:9b:f0 txqueuelen 1000 (Ethernet)
    RX packets 0 bytes 0 (0.0 B)
    RX errors 0 dropped 0 overruns 0 frame 0
    TX packets 0 bytes 0 (0.0 B)
    TX errors 0 dropped 0 overruns 0 carrier 0 collisions 0

eth0: flags=6147<UP, BROADCAST, SLAVE, MULTICAST>mtu 1500
    ether f0:ad:4e:28:9b:f1 txqueuelen 2048 (Ethernet)
    RX packets 0 bytes 0 (0.0 B)
    RX errors 0 dropped 0 overruns 0 frame 0
    TX packets 0 bytes 0 (0.0 B)
    TX errors 0 dropped 0 overruns 0 carrier 0 collisions 0

eth1: flags=4419<UP, BROADCAST, RUNNING, PROMISC, MULTICAST>mtu 1508
    inet6 fe80::f2ad:4eff:fe28:9bf0 prefixlen 64 scopeid 0x20<link>
    ether f0:ad:4e:28:9b:f0 txqueuelen 2048 (Ethernet)
    RX packets 0 bytes 0 (0.0 B)
    RX errors 0 dropped 0 overruns 0 frame 0
    TX packets 18 bytes 1838 (1.8 KB)
    TX errors 0 dropped 0 overruns 0 carrier 0 collisions 0

eth2: flags=6211<UP, BROADCAST, RUNNING, SLAVE, MULTICAST>mtu 1500
    ether f0:ad:4e:28:9b:f1 txqueuelen 2048 (Ethernet)
    RX packets 417 bytes 44263 (44.2 KB)
    RX errors 0 dropped 0 overruns 0 frame 0
    TX packets 389 bytes 34702 (34.7 KB)
    TX errors 0 dropped 0 overruns 0 carrier 0 collisions 0
```

```
lan0: flags=4099<UP, BROADCAST, MULTICAST>mtu 1500
    ether f0:ad:4e:28:9b:f0 txqueuelen1000 (Ethernet)
    RX packets 0 bytes 0 (0.0 B)
    RX errors 0 dropped0 overruns0 frame 0
    TX packets 0 bytes 0 (0.0 B)
    TX errors 0 dropped 0 overruns 0 carrier0 collisions 0

lan1: flags=4099<UP, BROADCAST, MULTICAST>mtu 1500
    ether f0:ad:4e:28:9b:f0 txqueuelen1000 (Ethernet)
    RX packets 0 bytes 0 (0.0 B)
    RX errors 0 dropped0 overruns0 frame 0
    TX packets 0 bytes 0 (0.0 B)
    TX errors 0 dropped 0 overruns 0 carrier0 collisions 0

lan2: flags=4099<UP, BROADCAST, MULTICAST>mtu 1500
    ether f0:ad:4e:28:9b:f0 txqueuelen1000 (Ethernet)
    RX packets 0 bytes 0 (0.0 B)
    RX errors 0 dropped0 overruns0 frame 0
    TX packets 0 bytes 0 (0.0 B)
    TX errors 0 dropped 0 overruns 0 carrier0 collisions 0

lan3: flags=4099<UP, BROADCAST, MULTICAST>mtu 1500
    ether f0:ad:4e:28:9b:f0 txqueuelen1000 (Ethernet)
    RX packets 0 bytes 0 (0.0 B)
    RX errors 0 dropped0 overruns0 frame 0
    TX packets 0 bytes 0 (0.0 B)
    TX errors 0 dropped 0 overruns 0 carrier0 collisions 0

lo: flags=73<UP, LOOPBACK, RUNNING>mtu 65536
inet127.0.0.1 netmask 255.0.0.0
    inet6 ::1 prefixlen128 scopeid 0x10<host>
loop txqueuelen1000 (Local Loopback)
    RX packets 51 bytes 4889 (4.8 KB)
    RX errors 0 dropped0 overruns0 frame 0
    TX packets 51 bytes 4889 (4.8 KB)
    TX errors 0 dropped 0 overruns 0 carrier0 collisions 0

root@moca289bf1:~# ^C
root@moca289bf1:~#
```

M-6.2 Using ping command to verify internet connection

```
root@moca289bf1:~# ping -c 10 www.google.com
PING www.google.com (142.251.43.4) 56(84) bytes of data.
64 bytes from tsa03s08-in-f4.1e100.net (142.251.43.4): icmp_seq=1 ttl=52 time=42.9 ms
64 bytes from tsa03s08-in-f4.1e100.net (142.251.43.4): icmp_seq=2 ttl=52 time=89.1 ms
64 bytes from tsa03s08-in-f4.1e100.net (142.251.43.4): icmp_seq=3 ttl=52 time=227 ms
64 bytes from tsa03s08-in-f4.1e100.net (142.251.43.4): icmp_seq=4 ttl=52 time=156 ms
64 bytes from tsa03s08-in-f4.1e100.net (142.251.43.4): icmp_seq=5 ttl=52 time=60.4 ms
64 bytes from tsa03s08-in-f4.1e100.net (142.251.43.4): icmp_seq=6 ttl=52 time=41.4 ms
64 bytes from tsa03s08-in-f4.1e100.net (142.251.43.4): icmp_seq=7 ttl=52 time=278 ms
64 bytes from tsa03s08-in-f4.1e100.net (142.251.43.4): icmp_seq=8 ttl=52 time=206 ms
64 bytes from tsa03s08-in-f4.1e100.net (142.251.43.4): icmp_seq=9 ttl=52 time=157 ms
64 bytes from tsa03s08-in-f4.1e100.net (142.251.43.4): icmp_seq=10 ttl=52 time=49.2 ms

--- www.google.com ping statistics ---
10 packets transmitted, 10 received, 0% packet loss, time 9013ms
rtt min/avg/max/mdev = 41.464/130.929/278.034/81.949 ms
root@moca289bf1:~#
```

M-7. Check the USB3.0 ports

M-7.1 checkUSB device without USB disk plugged

Enter command:lsusb

```
root@moca289bf1:~# lsusb
Bus 002 Device 001: ID 1d6b:0003 Linux Foundation 3.0 root hub
Bus 001 Device 001: ID 1d6b:0002 Linux Foundation 2.0 root hub
Bus 004 Device 002: ID 0424:5534 Standard Microsystems Corp. Hub
Bus 004 Device 001: ID 1d6b:0003 Linux Foundation 3.0 root hub
Bus 003 Device 002: ID 0424:2134 Standard Microsystems Corp. Hub
Bus 003 Device 001: ID 1d6b:0002 Linux Foundation 2.0 root hub
root@moca289bf1:~#
```

M-7.2 checkUSB device with 2 USB disks plugged

Enter command:lsusb

```
root@moca289bf1:~# lsusb
Bus 002 Device 001: ID 1d6b:0003 Linux Foundation 3.0 root hub
Bus 001 Device 001: ID 1d6b:0002 Linux Foundation 2.0 root hub
Bus 004 Device 003: ID 13fe:6300 Kingston Technology Company Inc.
Bus 004 Device 002: ID 0424:5534 Standard Microsystems Corp. Hub
Bus 004 Device 001: ID 1d6b:0003 Linux Foundation 3.0 root hub
Bus 003 Device 003: ID 0951:1624 Kingston Technology DataTraveler G2
Bus 003 Device 002: ID 0424:2134 Standard Microsystems Corp. Hub
Bus 003 Device 001: ID 1d6b:0002 Linux Foundation 2.0 root hub
root@moca289bf1:~#
```

M-7.3 checkdisk partitions

Enter command:cat /proc/partitions

```
root@moca289bf1:~# cat /proc/partitions
major minor #blocks name

 1         0      65536 ram0
31         0      3968 mtdblock0
31         1         64 mtdblock1
31         2         64 mtdblock2
179        0    15388672 mmcblk0
179        1    15387648 mmcblk0p1
 8         0    15474688 sda
 8         1    15466048 sda1
 8        16     3915776 sdb
 8        17     3915744 sdb1
root@moca289bf1:~#
```

M-7.4 checkdisk partitions with “df” command

```
root@moca289bf1:~# df
Filesystem      1K-blocks    Used Available Use% Mounted on
/dev/root        15014832 1046040  13183028   8% /
devtmpfs         1981884      0    1981884   0% /dev
tmpfs            2015548      0    2015548   0% /dev/shm
tmpfs            2015548    3156    2012392   1% /run
tmpfs             5120      0         5120   0% /run/lock
tmpfs            2015548      0    2015548   0% /sys/fs/cgroup
tmpfs            403108      0     403108   0% /run/user/0
/dev/sda1        15458400 9288768  6169632  61% /media/disk0
/dev/sdb1        3907552    288    3907264   1% /media/disk1
root@moca289bf1:~#
```

M-7.5 checkdisk partitions with “fdisk -l” command

```
root@moca289bf1:~# fdisk -l
Disk /dev/ram0: 64 MiB, 67108864 bytes, 131072 sectors
Units: sectors of 1 * 512 = 512 bytes
Sector size (logical/physical): 512 bytes / 4096 bytes
I/O size (minimum/optimal): 4096 bytes / 4096 bytes

Disk /dev/mtdblock0: 3.9 MiB, 4063232 bytes, 7936 sectors
Units: sectors of 1 * 512 = 512 bytes
Sector size (logical/physical): 512 bytes / 512 bytes
I/O size (minimum/optimal): 512 bytes / 512 bytes

Disk /dev/mtdblock1: 64 KiB, 65536 bytes, 128 sectors
Units: sectors of 1 * 512 = 512 bytes
Sector size (logical/physical): 512 bytes / 512 bytes
I/O size (minimum/optimal): 512 bytes / 512 bytes

Disk /dev/mtdblock2: 64 KiB, 65536 bytes, 128 sectors
Units: sectors of 1 * 512 = 512 bytes
Sector size (logical/physical): 512 bytes / 512 bytes
I/O size (minimum/optimal): 512 bytes / 512 bytes

Disk /dev/mmcblk0: 14.7 GiB, 15758000128 bytes, 30777344 sectors
Units: sectors of 1 * 512 = 512 bytes
Sector size (logical/physical): 512 bytes / 512 bytes
I/O size (minimum/optimal): 512 bytes / 512 bytes
Disklabel type: dos
Disk identifier: 0x89708921
```

check disk partitions with “fdisk -l” command (continued)

```
Device          Boot Start      End  Sectors  Size Id Type
/dev/mmcblk0p1 *    2048 30777343 30775296 14.7G 83 Linux
```

```
Disk /dev/sda: 14.8 GiB, 15846080512 bytes, 30949376 sectors
Units: sectors of 1 * 512 = 512 bytes
Sector size (logical/physical): 512 bytes / 512 bytes
I/O size (minimum/optimal): 512 bytes / 512 bytes
Disklabel type: dos
Disk identifier: 0xb9fc2146
```

```
Device      Boot Start        End  Sectors  Size Id Type
/dev/sda1    17280 30949375 30932096 14.8G  c W95 FAT32 (LBA)
```

```
Disk /dev/sdb: 3.8 GiB, 4009754624 bytes, 7831552 sectors
Units: sectors of 1 * 512 = 512 bytes
Sector size (logical/physical): 512 bytes / 512 bytes
I/O size (minimum/optimal): 512 bytes / 512 bytes
Disklabel type: dos
Disk identifier: 0x000087dd
```

```
Device      Boot Start        End  Sectors  Size Id Type
/dev/sdb1    *        63 7831551 7831489   3.8G  c W95 FAT32 (LBA)
root@moca289bf1:~#
```

M-8. top command

```
root@moca289bf1:~# top
top - 14:06:16 up 53 min, 1user, load average: 0.00, 0.00, 0.00
Tasks: 121 total, 1 running, 68sleeping, 0 stopped, 0 zombie
%Cpu(s): 0.0 us, 0.1sy, 0.0ni, 99.8 id, 0.0wa, 0.1hi, 0.0si, 0.0st
KiB Mem : 4031096 total, 3829240free, 87092 used, 114764 buff/cache
KiB Swap: 0 total, 0 free, 0 used. 3813692 avail Mem
```

PID	USER	PR	NI	VIRT	RES	SHR	S	%CPU	%MEM	TIME+	COMMAND
2697	root	20	0	5628	2776	2224	R	0.7	0.1	0:00.31	top
153	root	20	0	0	0	0	S	0.3	0.0	0:04.57	f212a200.m+
1	root	20	0	95492	8152	5764	S	0.0	0.2	0:01.85	systemd
2	root	20	0	0	0	0	S	0.0	0.0	0:00.00	kthreadd
3	root	0	-20	0	0	0	I	0.0	0.0	0:00.00	rcu_gp
4	root	0	-20	0	0	0	I	0.0	0.0	0:00.00	rcu_par_gp
8	root	0	-20	0	0	0	I	0.0	0.0	0:00.00	mm_percpu_+
9	root	20	0	0	0	0	S	0.0	0.0	0:00.04	ksoftirqd/0
10	root	20	0	0	0	0	I	0.0	0.0	0:00.06	rcu_preempt
11	root	rt	0	0	0	0	S	0.0	0.0	0:00.00	migration/0
12	root	20	0	0	0	0	S	0.0	0.0	0:00.00	cpuhp/0
13	root	20	0	0	0	0	S	0.0	0.0	0:00.00	cpuhp/1
14	root	rt	0	0	0	0	S	0.0	0.0	0:00.00	migration/1
15	root	20	0	0	0	0	S	0.0	0.0	0:00.02	ksoftirqd/1
18	root	20	0	0	0	0	S	0.0	0.0	0:00.00	cpuhp/2
19	root	rt	0	0	0	0	S	0.0	0.0	0:00.00	migration/2
20	root	20	0	0	0	0	S	0.0	0.0	0:00.02	ksoftirqd/2

M-9. Other useful commands like “lspci” and “lsmod”

```
root@moca289bf1:~# lspci
00:00.0 PCI bridge: Marvell Technology Group Ltd. Device 0110
root@moca289bf1:~#
```

```

root@moca289bf1:~# lsmod
Module                Size  Used by
xt_MASQUERADE16384    1
iptables_nat16384     1
nf_nat45056 2iptables_nat, xt_MASQUERADE
nf_conntrack118784 2nf_nat, xt_MASQUERADE
nf_defrag_ipv6        24576 1nf_conntrack
nf_defrag_ipv4        16384 1nf_conntrack
libcrc32c             16384 2nf_conntrack, nf_nat
bonding               135168 0
omap_rng20480         0
crc10dif_ce           16384 1
rng_core16384 1omap_rng
cfg80211              368640 0
rfkill32768 2cfg80211
ip_tables32768 1iptables_nat
x_tables36864 2ip_tables, xt_MASQUERADE
root@moca289bf1:~#

```

This device complies with part 15 of the FCC Rules. Operation is subject to the following two conditions:

(1) This device may not cause harmful interference, and (2) this device must accept any interference received, including interference that may cause undesired operation.

Any changes or modifications not expressly approved by the party responsible for compliance could void the user's authority to operate the equipment.

This equipment has been tested and found to comply with the limits for a Class B digital device, pursuant to part 15 of the FCC Rules. These limits are designed to provide reasonable protection against harmful interference in a residential installation. This equipment generates, uses and can radiate radio frequency energy and, if not installed and used in accordance with the instructions, may cause harmful interference to radio communications. However, there is no guarantee that interference will not occur in a particular installation. If this equipment does cause harmful interference to radio or television reception, which can be determined by turning the equipment off and on, the user is encouraged to try to correct the interference by one or more of the following measures:

- Reorient or relocate the receiving antenna.
- Increase the separation between the equipment and receiver.
- Connect the equipment into an outlet on a circuit different from that to which the receiver is connected.
- Consult the dealer or an experienced radio/TV technician for help.

FCC Radiation Exposure Statement:

This equipment complies with FCC radiation exposure limits set forth for an uncontrolled environment.

This transmitter must not be co-located or operating in conjunction with any other antenna or transmitter.

This equipment should be installed and operated with minimum distance 20cm between the radiator &you body.

=== End of File ===