

## ESPRESSObin ULTRA- Quick Start Guide -Rev 04

### Revision History

Date	Revision	Board Rev	Description
Oct 21, 2019	Rev 01	V0-0-0	
Dec 02, 2019	Rev 02	V0-0-0	Add pictures with enclosure on page 4 Add DIN RAIL mounting on page 18 Package contents modified in Section B
Mar 03, 2020	Rev 03	V0-0-0	Reorganize the index table
Nov 09, 2021	Rev 04	V0-0-0	Correct typos on page 13

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## A. Appearance

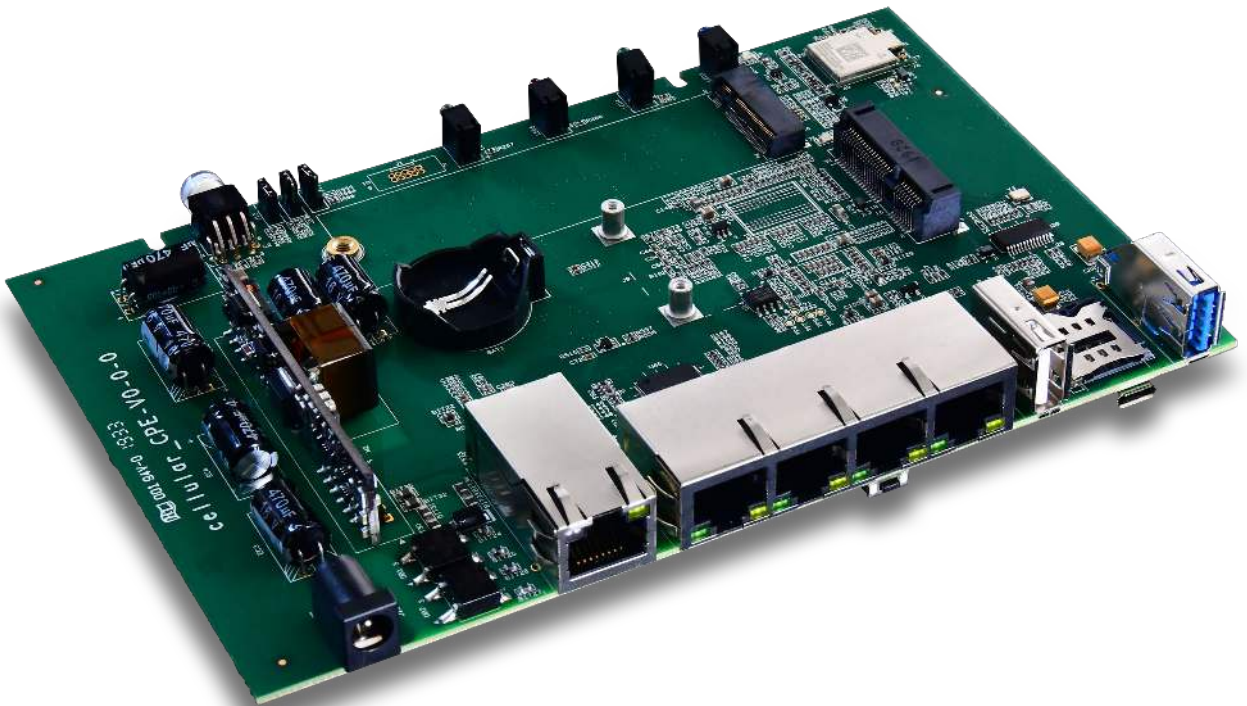
### A-1. Front view



### A-2. Back view



### A-3. PCBA



## B. Package contents

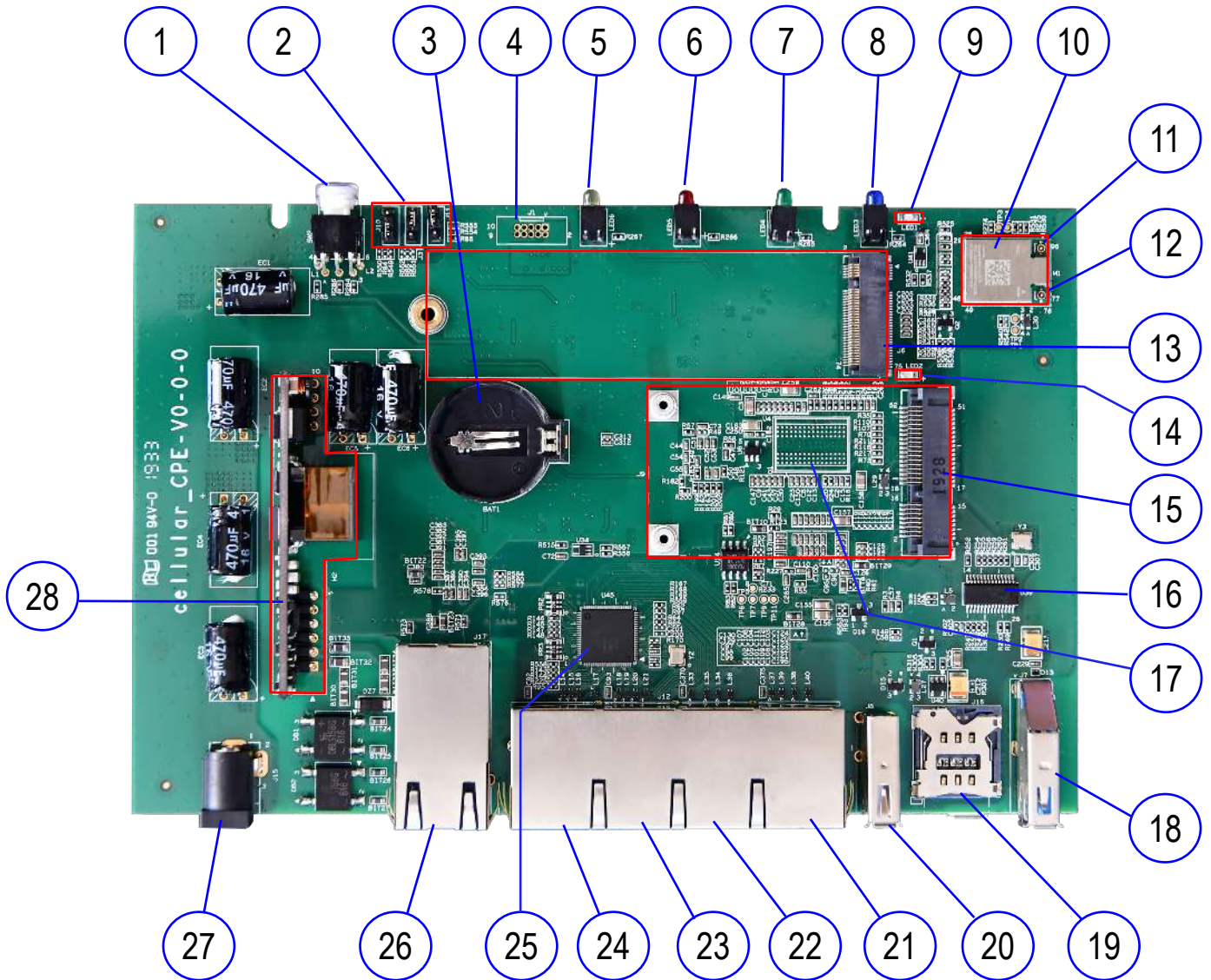
	Content List		Remark
1	ESPRESSOBIN ULTRA	1 unit	PCBA with enclosure
2	USB to Micro-USB Cable	1 pc	For debugging console
3	WiFi /BT Antenna	2 pcs	2.4GHz/5GHz dual band
4.	Wall mount DIN rail hook	2 pcs	See section J
5	Warranty card	1 pc	
Optional	AC to DC 12V Power Adapter	1 pc	Input 90-240VAC / output 12V,2A DC
Optional	4G/ LTE Antenna	2 pcs	4G/LTE Antenna

## C. Key Features

<b>SoC</b>	<ul style="list-style-type: none"> <li>• Marvell ARMADA 3720</li> <li>• Dual Core ARMv8 Cortex-A53</li> <li>• CPU frequency @1200MHz</li> </ul>
<b>Memory</b>	<ul style="list-style-type: none"> <li>• 1 GB / 2GB DDR4 -16bit</li> </ul>
<b>Storage</b>	<ul style="list-style-type: none"> <li>• 4MB SPI NOR flash</li> <li>• 8GB eMMC flash</li> <li>• SATA SSD socket -M.2-2280</li> </ul>
<b>Ethernet</b>	<ul style="list-style-type: none"> <li>• 1x Gb RJ45 WAN with POE input</li> <li>• 4x GB RJ45 LAN</li> </ul>
<b>Wireless</b>	<ul style="list-style-type: none"> <li>• 802.11 a/b/g/n + ac/ 2T2R WiFi +BT4.2 -on board with mini-PCIe interface</li> </ul>
<b>USB</b>	<ul style="list-style-type: none"> <li>• 1x USB 3.0 type A</li> <li>• 1x USB 2.0 type A</li> <li>• 1x micro USB UART port for debug console</li> </ul>
<b>Expansion</b>	<ul style="list-style-type: none"> <li>• 1x M.2-2280 SSD socket</li> <li>• 1x Mini-PCIe 2.0 socket with USB2.0 interface for 3G/4G LTE</li> <li>• 1x SIM card slot</li> </ul>
<b>Debugging</b>	<ul style="list-style-type: none"> <li>• 1x JTAG Cortex port, 10-pin</li> <li>• 1x micro USB UART connector</li> </ul>
<b>Miscellaneous</b>	<ul style="list-style-type: none"> <li>• DC 12V Power Jack</li> <li>• Genuine POE power input through WAN port</li> <li>• 4x Software controlled LEDs</li> <li>• Power on/off button with LED indication</li> <li>• Reset button</li> </ul>

## D. Locations of All I/O Connectors and Major Parts

D-1. Top Side

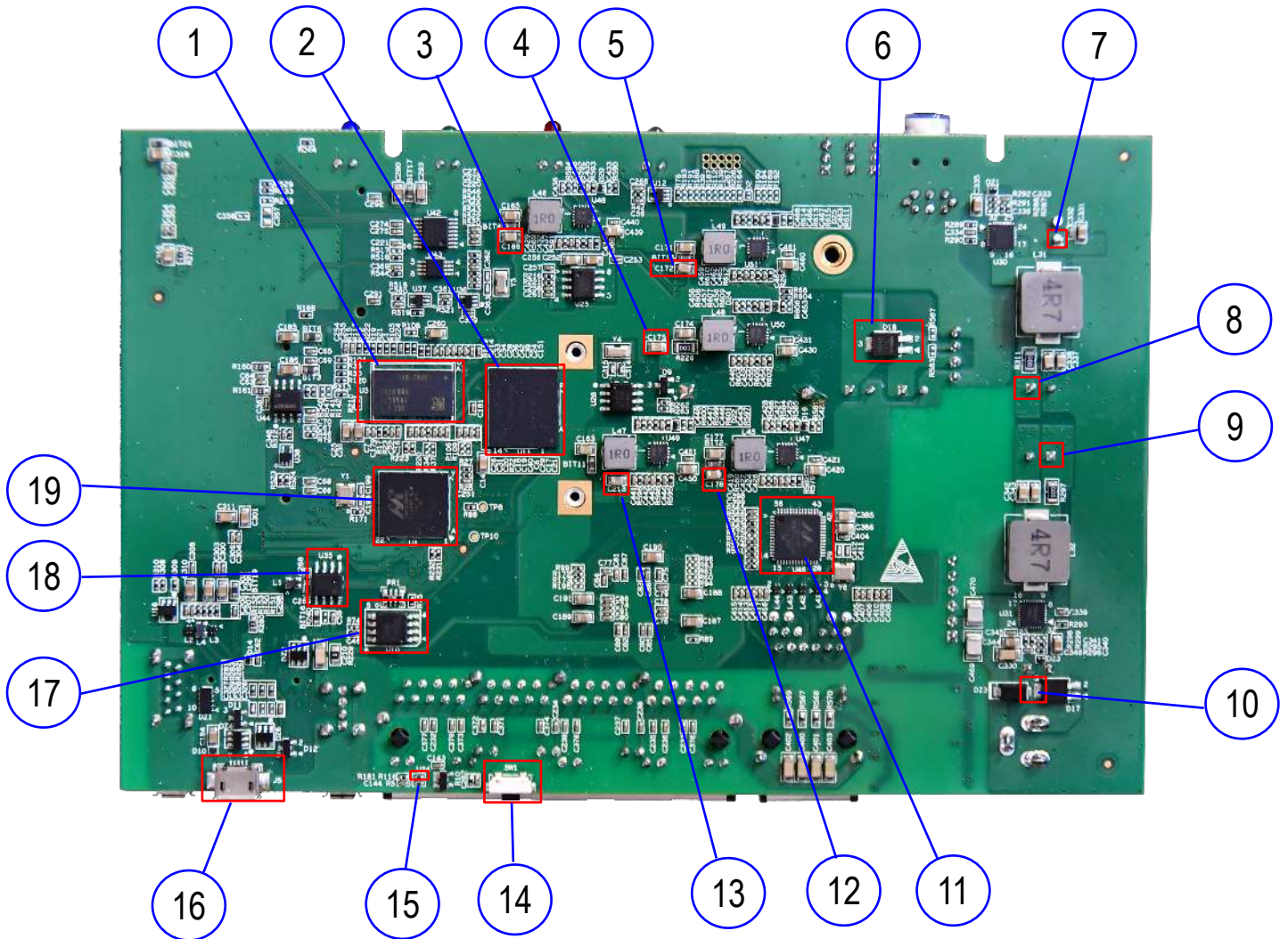




## D-2. Top Side connectors and significant parts

No.	Part location	Description 1	Description 2
1	SW2	Power Switch	With LED indication
2	J11/ J3/ J10	MPP1_7/MPP1_6/MPP1_5	Boot Mode selection <a href="#">*see section F-1</a>
3	BAT1	CR2032 /3V battery	Power for Real-Time Clock
4	J1	JTAG Debugger (not populated)	5x2 pins, <a href="#">*see section E-1</a>
5	LED6	Yellow color	MPP1_14 Software-driven (3.3V)
6	LED5	Red color	MPP1_13 Software-driven (3.3V)
7	LED4	Green color	MPP1_12 Software-driven (3.3V)
8	LED3	Blue color	MPP1_11 Software-driven (3.3V)
9	LED1	Green color	M.2 SSD LED (3.3V) connected to J6
10	M1	WiFi module 8.2.11/a/b/g/n/ac 2T2R WIFI +BT4.2 LE	PCIe M.2 type 1216
11	M1 Antenna	WiFi Ant_B/ BT Ant	U.FL Micro coaxial connector 2.0mmx 2.0mm
12	M1 Antenna	WiFi Ant_A	U.FL Micro coaxial connector 2.0mmx 2.0mm
13	J6	SATA SSD connector	M.2-22mmx 80mm
14	LED2	Green color	USIM LED (3.3V) connected to J9
15	J9	3G/4G LTE mini-PCIe connector	1) With s USB 2.0 signals only 2) Connect to SIM card slot J16
16	U39	USB2.0/ 4-port HUB	
17	U4	SDRAM Rank2	16bit DDR4
18	J7	USB3.0 type A	
19	J16	SIM card nano slot	Controlled by J9
20	J8	USB2.0 type A	Downstream from U39 USB HUB
21	J12-D	RJ45	1Gb RJ45-LAN#4
22	J12-C	RJ45	1Gb RJ45-LAN#3
23	J12-B	RJ45	1Gb RJ45-LAN#2
24	J12-A	RJ45	1Gb RJ45-LAN#1
25	U45	Gb ethernet switch	6-port switch to J12-A/B/C/D and J17
26	J17	RJ45 with POE	1Gb RJ45 for WAN / POE power IN
27	J15	DC jack for 12VDC in	Center positive 2.1mm diameter
28	M2	POE module	DC12V/30W output, 802.3at/ 802.3af compliant

### D-3. Bottom Side



#### D-4. Bottom Side connectors and significant parts

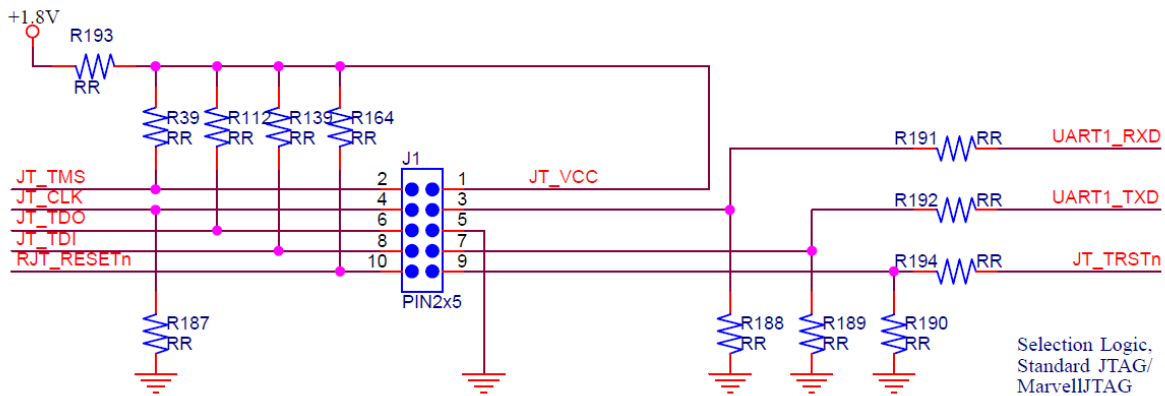
Number	Part location	Name	
1	U3	SDRAM Rank1	16bit DDR4 (1GB)
2	U11	eMMC	8GB-8bit
3	C166	+1.2V (+DDR_VCC) power rail	5 <sup>th</sup> power stage
4	C175	+1.1V (CPU_VCore)power rail	7 <sup>th</sup> power stage
5	C172	+1.8V power rail	3 <sup>rd</sup> power stage
6	D18	+12V POE output diode	Pin1/pin2 in, pin3 out to +12V power rail
7	EC1	+12V power rail	1 <sup>st</sup> power stage (input)
8	EC2	+5V power rail	1 <sup>st</sup> power stage (output)
9	EC4	+3.3V power rail	2 <sup>nd</sup> power stage
10	D17	+12V DC power input diode	Pin1/pin2 in, pin3 out to +12V power rail
11	U46	Gb Ethernet PHY	Connected to J17
12	C178	+1.5V power rail	4 <sup>th</sup> power stage
13	C213	+1.15V power rail	6 <sup>th</sup> power stage
14	SW1	Reset switch	Press down to pull low MRn
15	R116	MRn	Low active master reset signal to CPU's SYSRSTn
16	J5	Micro-USB for console	UART1
17	U10	SPI NOR Flash Boot ROM	4MB
18	U35	UART to USB bridge	
19	U1	Marvell A3720 SoC	

## E. User interfaces

### E-1. J1- JTAG debugger Pin definition

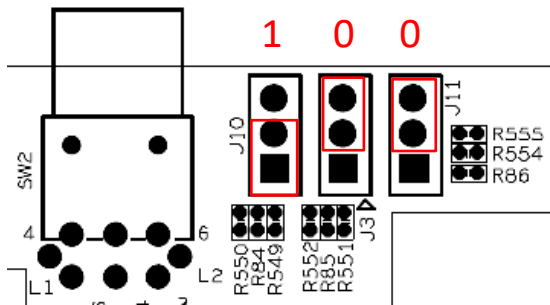
Pin#	Signal	Remark	Pin#	Signal	Remark
1	+1.8V	NC with R193 not populated	2	JT_TMS	
3	UART1_RXD	NC with R191 not populated	4	JT_CLK	
5	GND		6	JT_TDO	
7	UART1_TXD	NC with R192 not populated	8	JT_TDI	
9	JT_TRSTn	NC with R194 not populated	10	JT_RESETn	

#### E-1-1. J1- JTAG debugger schematic



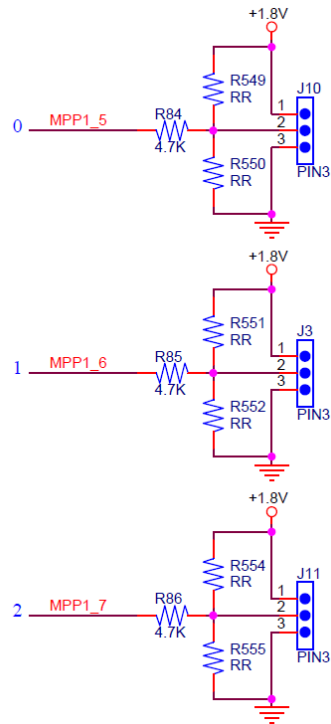
## F. Bootstrap wire jumpers

F-1. Boot Mode – J11, J3, J10



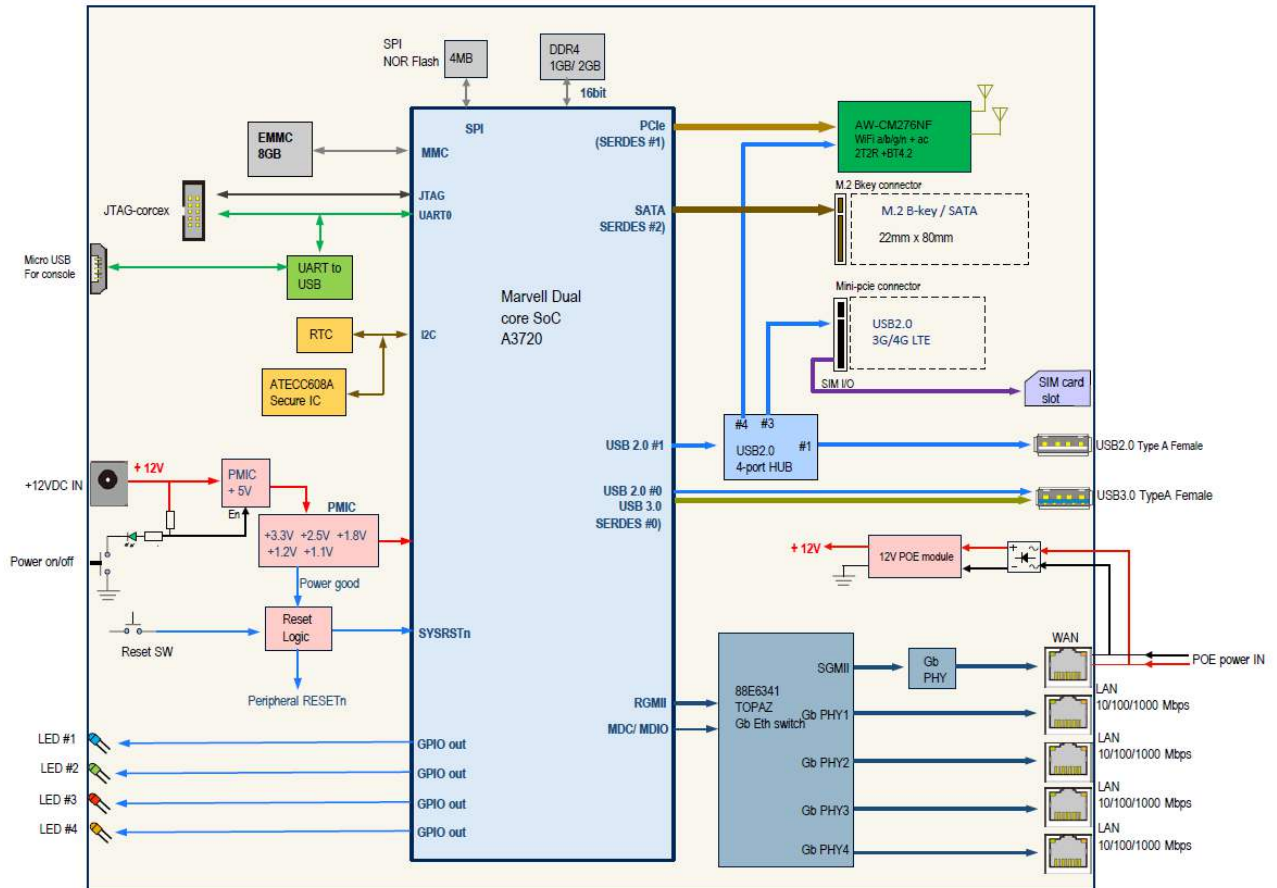
**MPP1\_[7:5]**

- 1 : Serial NOR Flash Download Mode.
- 2 : eMMC Download Mode.
- 3 : eMMC Alternate Download Mode.
- 4 : SATA Download Mode.
- 5 : Serial NAND Flash Download Mode.
- 6 : UART Mode.
- 7 : SD Card.



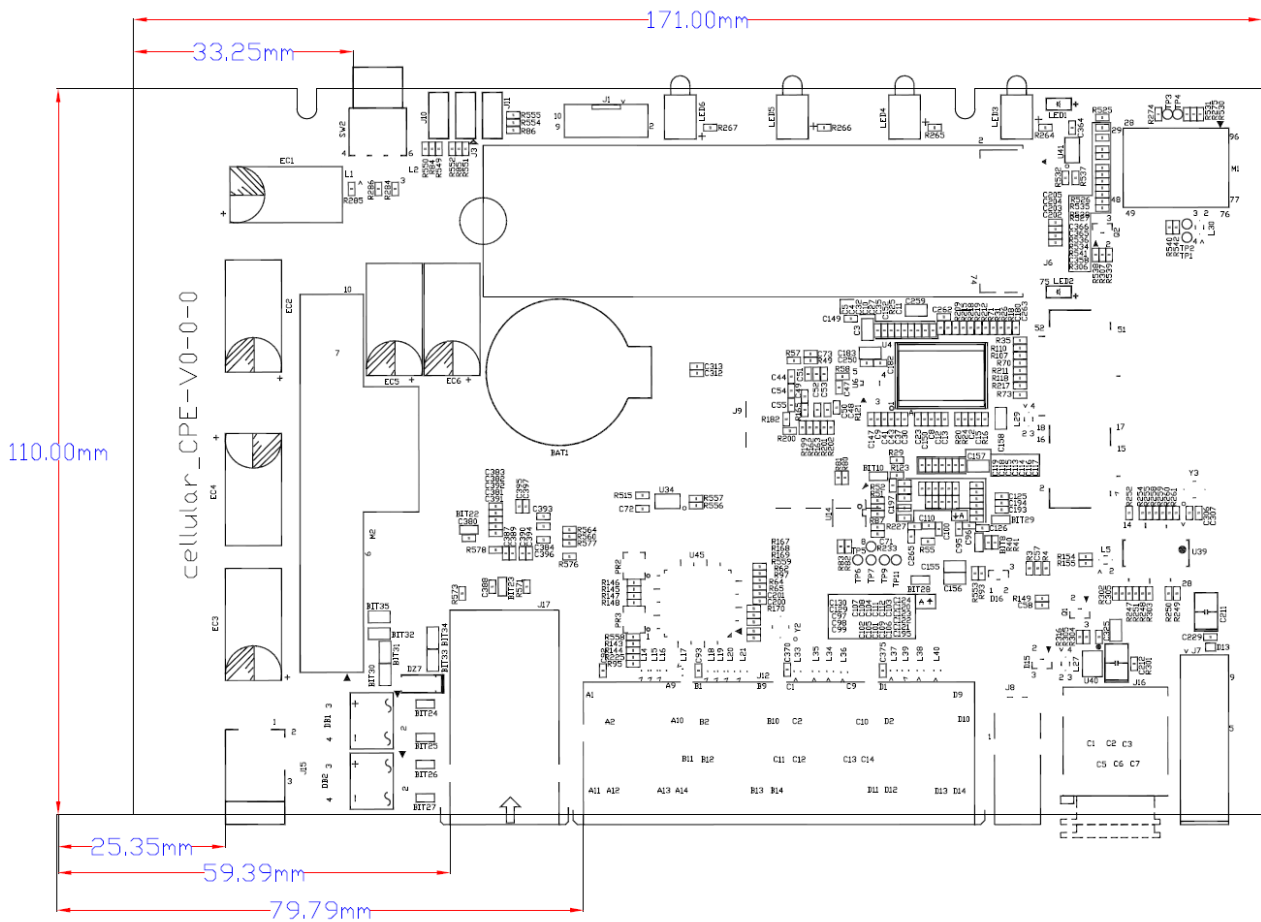
ESPRESSOBIN ULTRA Boot Mode	MPP1_7 (J11)	MPP1_6 (J3)	MPP1_5 (J10)	Hex
Serial NOR Flash Download Mode	0	0	1	0x1
eMMC Download Mode	0	1	0	0x2
eMMC Alternate Download Mode	0	1	1	0x3
SATA Download Mode	1	0	0	0x4
Serial NAND Flash Download Mode	1	0	1	0x5
UART Mode	1	1	0	0x6
Reserved	1	1	1	0x7

## G. Block Diagram

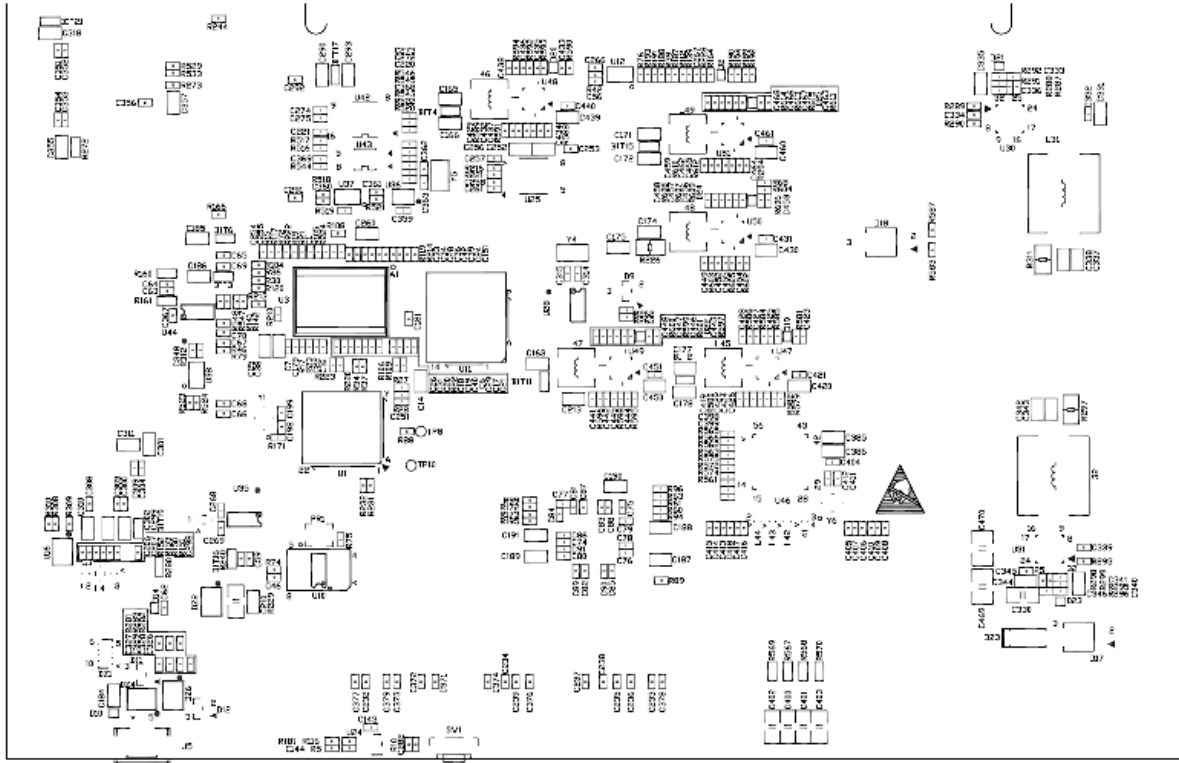


## H. Board Dimensions

### H-1. Top Side silkscreen

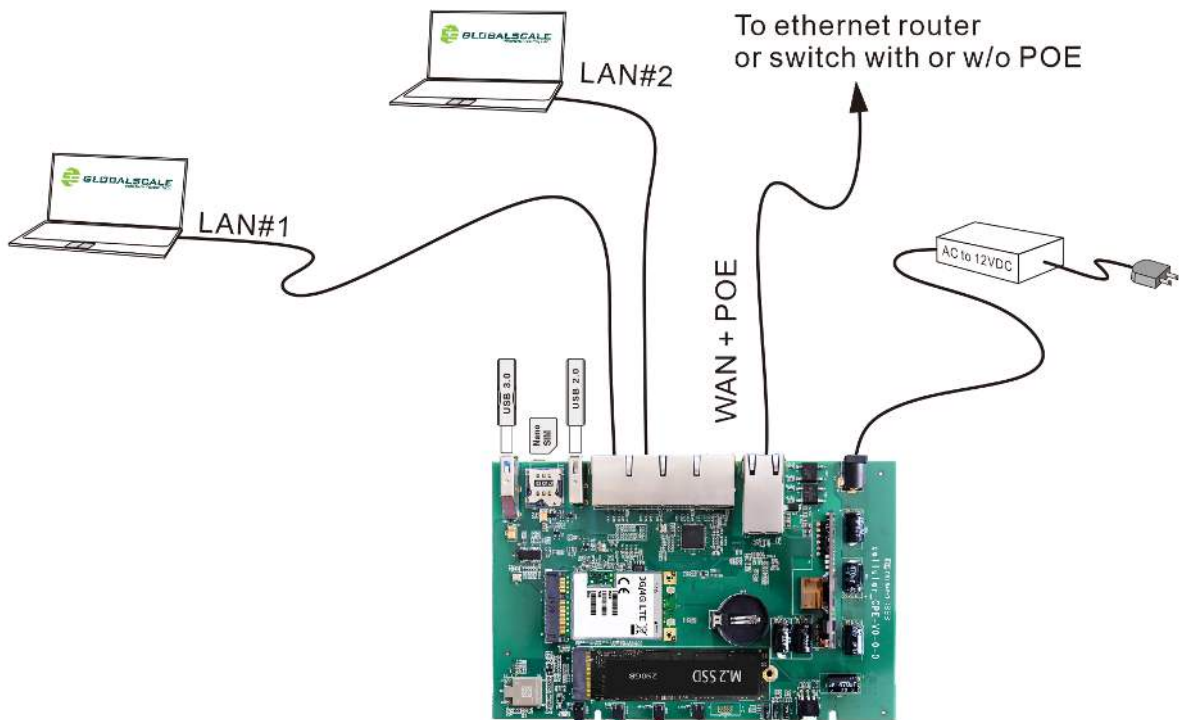


## H-2. Bottom Side silkscreen





## I. Cable connection for testing



## J. DIN rail mounting

There are two MK-048 (10mmLx43mmWx 19mmH)DIN rail mounting pieces on the back of ESPRESSObin enclosure as shown in the picture below.



Please use the appropriate DIN RAIL like MK-070 or similar for mounting on the wall.



## K. Preparation for power on

### K-1. Hardware:

- a. Linux PC installed with minicom, putty or Windows PC installed with putty
- b. ESPRESSOBIN ULTRA unit
- c. Connect Ethernet cable from IP router or IP switch (optional) to WAN port with or without POE power
- d. USB3.0 Flash disks (optional)
- e. USB2.0 Flash disks (optional)
- f. 3G/ 4G LTE module (optional)
- g. M.2 2280 SSD module (optional)

### K-2. Software:

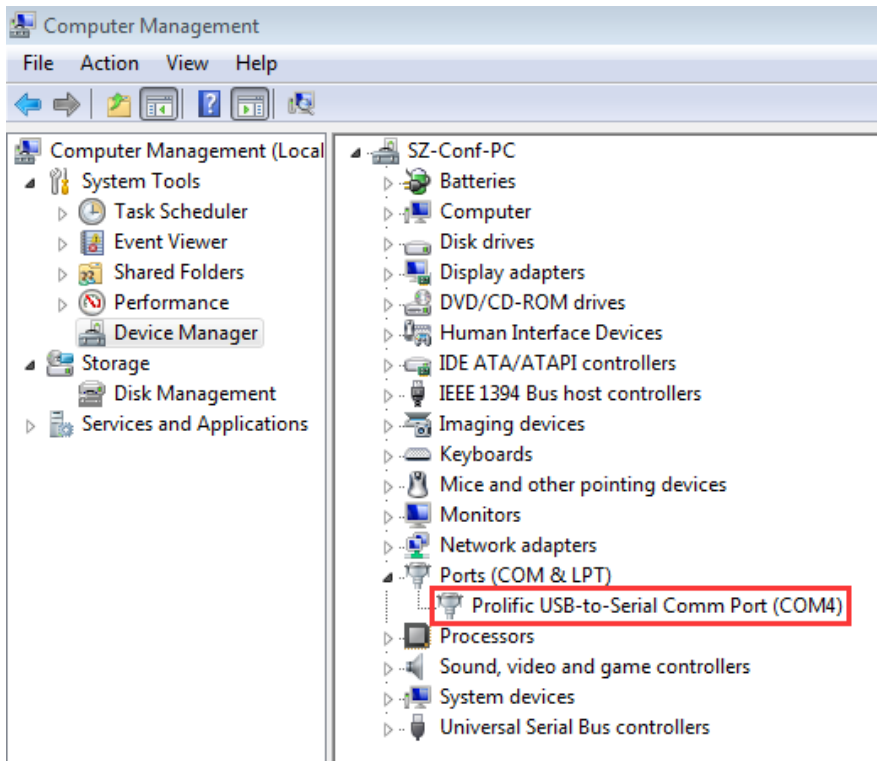
- a. Putty for Linux or Windows PC  
Please go on web and download putty.exe

Visit the following web site for more information

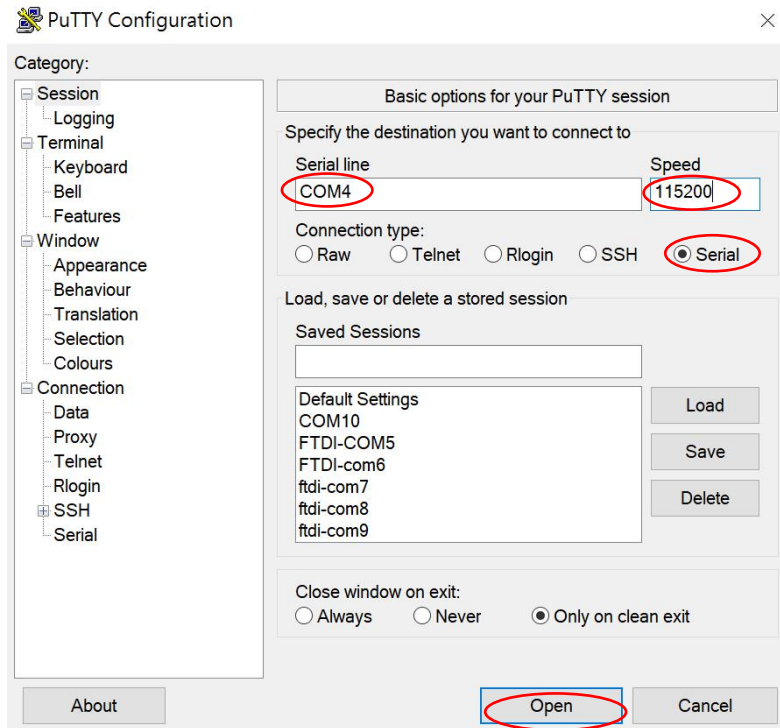
<http://www.globalscaletechnologies.com/t-downloads.aspx>

## L. Find com port and connect with putty

1. Connect ESPRESSOBIN ULTRA's micro-USB port (J5) to PC's USB port by USB 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"



## M. Start running ESPRESSOBIN ULTRA

### 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

```
Ubuntu 18.04 LTS ccpe999904 ttyMV0
```

```
#####
the default root password is 'admin'.
#####
```

```
ccpe999904 login: TIM-1.0
WTMI-devel-18.12.1-67f01b7
WTMI: system early-init
SVC REV: 5, CPU VDD voltage: 1.213V
NOTICE: Booting Trusted Firmware
NOTICE: BL1: v1.5(release):711ecd32 (Marvell-armada-18.09.4)
NOTICE: BL1: Built : 15:20:15, Sep 18 2019
NOTICE: BL1: Booting BL2
NOTICE: BL2: v1.5(release):711ecd32 (Marvell-armada-18.09.4)
NOTICE: BL2: Built : 15:20:18, Sep 18 2019
NOTICE: BL1: Booting BL31
NOTICE: BL31: v1.5(release):711ecd32 (Marvell-armada-18.09.4)
NOTICE: BL31: Built : 15
```

```
U-Boot 2017.03-armada-18.09.1-g51aa6c4772 (Sep 18 2019 - 15:19:13 +0800)
```

```
Model: gti cellular cpe board
```

```
CPU      1200 [MHz]
L2       1200 [MHz]
NB AXI   300 [MHz]
SB AXI   250 [MHz]
DDR      750 [MHz]
```

```
DRAM: 1 GiB
```

```
U-Boot DT blob at : 000000003f716f38
```

```
SF: Detected mx25u3235f with page size 256 Bytes, erase size 64 KiB, total 4 MiB
```

```
Comphy chip #0:
```

```
Comphy-0: USB3_HOST0
```

```
Comphy-1: PEX0          2.5 Gbps
```

```
Comphy-2: SATA0
```

```
SATA link 0 timeout.
```

```
AHCI 0001.0300 32 slots 1 ports 6 Gbps 0x1 impl SATA mode
```

```
flags: ncq led only pmp fbss pio slum part sxs
```

```
PCIE-0: Link up
```

```
MMC: sdhci@d8000: 0
```

```
Net: eth0: neta@30000 [PRIME]
```

```
Hit any key to stop autoboot: 0
```

```
Marvell>> <INTERRUPT>
```

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

Enter “boot” to continue boot up if interrupted.

## M-2. Login root with password “admin”

```
#####
the default root password is 'admin'.
#####

ccpe999904 login: root
Password:
Last login: Wed Oct  9 01:12:03 UTC 2019 on ttyMVO
Welcome to Ubuntu 18.04 LTS (GNU/Linux 4.19.62-00013-gf37d8da9d13e aarch64)

* Documentation:  https://help.ubuntu.com
* Management:    https://landscape.canonical.com
* Support:       https://ubuntu.com/advantage

  _____
 |  _ \| _ \| _ \| _ \| | | | | | | | |
 | |_) | |_) | |_) | |_) |
 |_____|_____|_____|_____|

Welcome to Cellulr CPE development board!

For security reason, we recommended to change the password after first login.

Do you want to change default password? [Y/n]:
```

You may decide here whether to change the password or not?

### M-3. Check the login name and the current path

```
root@ccpe999904:~# whoami
root
root@ccpe999904:~# pwd
/root
root@ccpe999904:~#
```

### M-4. Check the kernel version

Enter command: `uname -a`

```
root@ccpe999904:~# uname -a
Linux ccpe999904 4.19.62-00013-gf37d8da9d13e #33 SMP PREEMPT Wed Sep 18 07:43:37 CST 2019 aarch64
aarch64 aarch64 GNU/Linux
root@ccpe999904:~#
```

### M-5. Check the CPU information



### M-5-1. check with command “cat /proc/cpuinfo”

There are 2 processors as you shall see

```

root@ccpe999904:/# cd ..
root@ccpe999904:/# pwd
/
root@ccpe999904:/# cat /proc/cpuinfo
processor       : 0
BogoMIPS      : 25.00
Features       : fp asimd evtstrm aes pmull sha1 sha2 crc32 cpuid
CPU implementer : 0x41
CPU architecture: 8
CPU variant    : 0x0
CPU part       : 0xd03
CPU revision   : 4

processor       : 1
BogoMIPS      : 25.00
Features       : fp asimd evtstrm aes pmull sha1 sha2 crc32 cpuid
CPU implementer : 0x41
CPU architecture: 8
CPU variant    : 0x0
CPU part       : 0xd03
CPU revision   : 4

root@ccpe999904:/#
    
```

### M-5-2. check with lscpu command

```

root@ccpe999904:/# lscpu
Architecture:      aarch64
Byte Order:        Little Endian
CPU(s):            2
On-line CPU(s) list: 0,1
Thread(s) per core: 1
Core(s) per socket: 2
Socket(s):         1
NUMA node(s):     1
Vendor ID:         ARM
Model:             4
Model name:        Cortex-A53
Stepping:          r0p4
CPU max MHz:       1200.0000
CPU min MHz:       200.0000
BogoMIPS:          25.00
NUMA node0 CPU(s): 0,1
Flags:             fp asimd evtstrm aes pmull sha1 sha2 crc32 cpuid
root@ccpe999904:/#
    
```

## M-6. Check the Ethernet connection

### M-6-1. heck with ifconfig command

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

```

root@ccpe999904:/# ifconfig
br0: flags=4163<UP,BROADCAST,RUNNING,MULTICAST> mtu 1500
    inet 192.168.84.1 netmask 255.255.255.0 broadcast 192.168.84.255
    inet6 fe80::f2ad:4eff:fe0b:f533 prefixlen 64 scopeid 0x20<link>
    ether f0:ad:4e:0b:f5:33 txqueuelen 1000 (Ethernet)
    RX packets 0 bytes 0 (0.0 B)
    RX errors 0 dropped 0 overruns 0 frame 0
    TX packets 15 bytes 1146 (1.1 KB)
    TX errors 0 dropped 0 overruns 0 carrier 0 collisions 0

eth0: flags=4419<UP,BROADCAST,RUNNING,PROMISC,MULTICAST> mtu 1500
    inet6 fe80::251:82ff:fe11:2200 prefixlen 64 scopeid 0x20<link>
    ether 00:51:82:11:22:00 txqueuelen 1024 (Ethernet)
    RX packets 79 bytes 7933 (7.9 KB)
    RX errors 0 dropped 0 overruns 0 frame 0
    TX packets 53 bytes 5246 (5.2 KB)
    TX errors 0 dropped 0 overruns 0 carrier 0 collisions 0
    device interrupt 12

lan0: flags=4099<UP,BROADCAST,MULTICAST> mtu 1500
    ether f0:ad:4e:99:99:00 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

lan1: flags=4099<UP,BROADCAST,MULTICAST> mtu 1500
    ether f0:ad:4e:99:99:01 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

lan2: flags=4099<UP,BROADCAST,MULTICAST> mtu 1500
    ether f0:ad:4e:99:99:02 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
    
```

## Ifconfig command (continued)

```

lan3: flags=4099<UP,BROADCAST,MULTICAST> mtu 1500
    ether f0:ad:4e:99:99:03 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

lo: flags=73<UP,LOOPBACK,RUNNING> mtu 65536
    inet 127.0.0.1 netmask 255.0.0.0
    inet6 ::1 prefixlen 128 scopeid 0x10<host>
    loop txqueuelen 1000 (Local Loopback)
    RX packets 6584 bytes 395690 (395.6 KB)
    RX errors 0 dropped 0 overruns 0 frame 0
    TX packets 6584 bytes 395690 (395.6 KB)
    TX errors 0 dropped 0 overruns 0 carrier 0 collisions 0

uap0: flags=4163<UP,BROADCAST,RUNNING,MULTICAST> mtu 1500
    inet6 fe80::f2ad:4eff:fe0b:f533 prefixlen 64 scopeid 0x20<link>
    ether f0:ad:4e:0b:f5:33 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 30 dropped 0 overruns 0 carrier 0 collisions 0

wan: flags=4163<UP,BROADCAST,RUNNING,MULTICAST> mtu 1500
    inet 192.168.3.19 netmask 255.255.255.0 broadcast 192.168.3.255
    inet6 fe80::f2ad:4eff:fe99:9904 prefixlen 64 scopeid 0x20<link>
    ether f0:ad:4e:99:99:04 txqueuelen 1000 (Ethernet)
    RX packets 79 bytes 6195 (6.1 KB)
    RX errors 0 dropped 0 overruns 0 frame 0
    TX packets 37 bytes 3714 (3.7 KB)
    TX errors 0 dropped 0 overruns 0 carrier 0 collisions 0

root@ccpe999904:/#
    
```

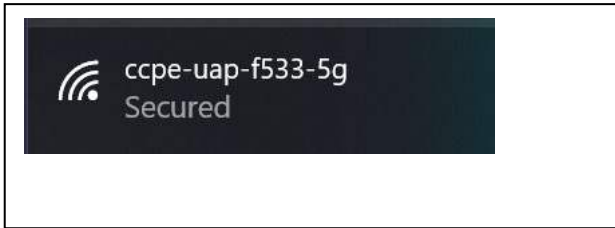
## M-6-2. Ping to verify the connection

```
root@ccpe999904:~# ping -c 10 www.google.com
PING www.google.com (216.58.200.228) 56(84) bytes of data.
64 bytes from tsa03s01-in-f228.1e100.net (216.58.200.228): icmp_seq=1 ttl=52 time=53.5 ms
64 bytes from tsa03s01-in-f228.1e100.net (216.58.200.228): icmp_seq=2 ttl=52 time=46.2 ms
64 bytes from tsa03s01-in-f228.1e100.net (216.58.200.228): icmp_seq=3 ttl=52 time=139 ms
64 bytes from tsa03s01-in-f228.1e100.net (216.58.200.228): icmp_seq=4 ttl=52 time=158 ms
64 bytes from tsa03s01-in-f228.1e100.net (216.58.200.228): icmp_seq=5 ttl=52 time=58.1 ms
64 bytes from tsa03s01-in-f228.1e100.net (216.58.200.228): icmp_seq=6 ttl=52 time=53.6 ms
64 bytes from tsa03s01-in-f228.1e100.net (216.58.200.228): icmp_seq=7 ttl=52 time=48.0 ms
64 bytes from tsa03s01-in-f228.1e100.net (216.58.200.228): icmp_seq=8 ttl=52 time=49.7 ms
64 bytes from tsa03s01-in-f228.1e100.net (216.58.200.228): icmp_seq=9 ttl=52 time=47.7 ms
64 bytes from tsa03s01-in-f228.1e100.net (216.58.200.228): icmp_seq=10 ttl=52 time=56.5 ms

--- www.google.com ping statistics ---
10 packets transmitted, 10 received, 0% packet loss, time 9006ms
rtt min/avg/max/mdev = 46.237/71.214/158.941/39.425 ms
root@ccpe999904:~#
root@ccpe999904:~#
root@ccpe999904:~# ping -c 10 www.baidu.com
PING www.wshifen.com (103.235.46.39) 56(84) bytes of data.
64 bytes from 103.235.46.39 (103.235.46.39): icmp_seq=1 ttl=52 time=73.5 ms
64 bytes from 103.235.46.39 (103.235.46.39): icmp_seq=2 ttl=52 time=63.2 ms
64 bytes from 103.235.46.39 (103.235.46.39): icmp_seq=3 ttl=52 time=71.8 ms
64 bytes from 103.235.46.39 (103.235.46.39): icmp_seq=4 ttl=52 time=70.3 ms
64 bytes from 103.235.46.39 (103.235.46.39): icmp_seq=5 ttl=52 time=82.1 ms
64 bytes from 103.235.46.39 (103.235.46.39): icmp_seq=6 ttl=52 time=79.0 ms
64 bytes from 103.235.46.39 (103.235.46.39): icmp_seq=7 ttl=52 time=74.2 ms
64 bytes from 103.235.46.39 (103.235.46.39): icmp_seq=8 ttl=52 time=81.5 ms
64 bytes from 103.235.46.39 (103.235.46.39): icmp_seq=9 ttl=52 time=71.9 ms
64 bytes from 103.235.46.39 (103.235.46.39): icmp_seq=10 ttl=52 time=117 ms

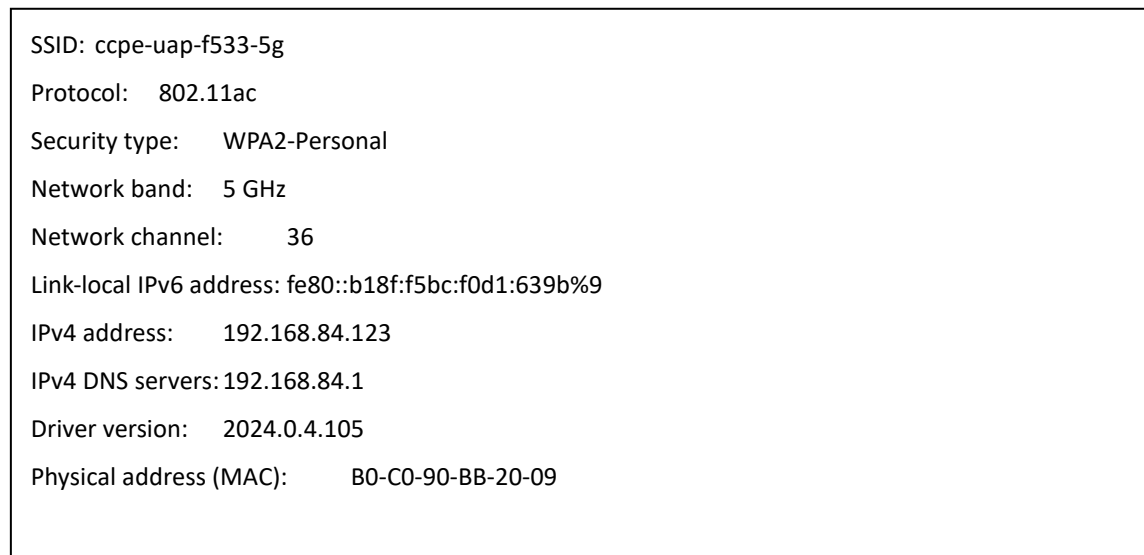
--- www.wshifen.com ping statistics ---
10 packets transmitted, 10 received, 0% packet loss, time 17014ms
rtt min/avg/max/mdev = 63.239/78.497/117.013/13.915 ms
root@ccpe999904:~#
root@ccpe999904:~#
```

### M-6-3. Connect to uap0



The password is '12345678'

below is uap0 information



## M-7. Check USB connection

### M-7-1. Check USB device without USB disk plugged

Enter command: lsusb

Here are 1 USB3.0 port and 2 USB2.0 ports (one with USB3.0) found.

```

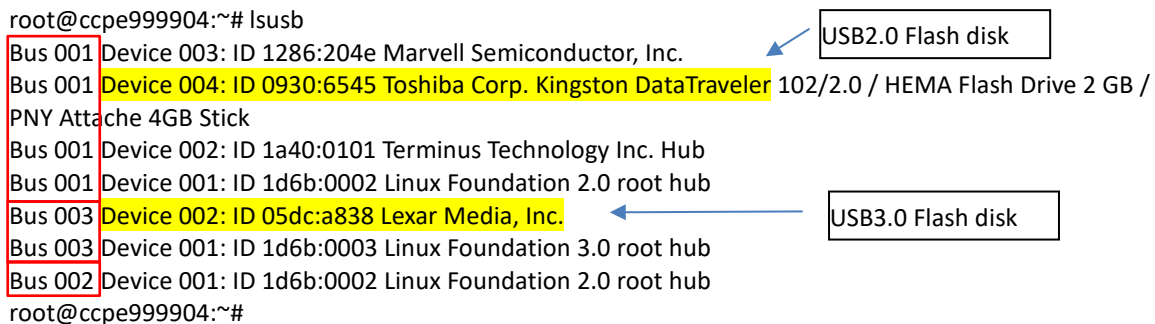
root@ccpe999904:~# lsusb
Bus 001 Device 003: ID 1286:204e Marvell Semiconductor, Inc.
Bus 001 Device 002: ID 1a40:0101 Terminus Technology Inc. Hub
Bus 001 Device 001: ID 1d6b:0002 Linux Foundation 2.0 root hub
Bus 003 Device 001: ID 1d6b:0003 Linux Foundation 3.0 root hub
Bus 002 Device 001: ID 1d6b:0002 Linux Foundation 2.0 root hub
root@ccpe999904:~#
    
```

### M-7-2. Check USB device with 2 USB disks plugged and found

After inserting 1 USB2.0 flash disk and another USB3.0 flash disk

```

root@ccpe999904:~# lsusb
Bus 001 Device 003: ID 1286:204e Marvell Semiconductor, Inc.
Bus 001 Device 004: ID 0930:6545 Toshiba Corp. Kingston DataTraveler 102/2.0 / HEMA Flash Drive 2 GB / PNY Attache 4GB Stick
Bus 001 Device 002: ID 1a40:0101 Terminus Technology Inc. Hub
Bus 001 Device 001: ID 1d6b:0002 Linux Foundation 2.0 root hub
Bus 003 Device 002: ID 05dc:a838 Lexar Media, Inc.
Bus 003 Device 001: ID 1d6b:0003 Linux Foundation 3.0 root hub
Bus 002 Device 001: ID 1d6b:0002 Linux Foundation 2.0 root hub
root@ccpe999904:~#
    
```



## M-8. Check storage devices

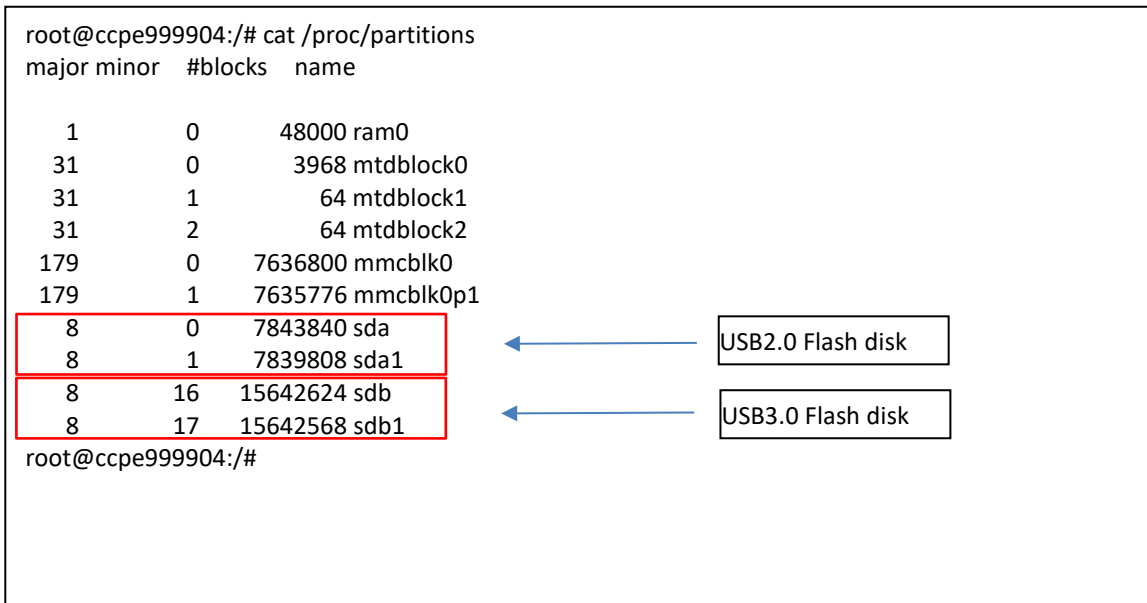
### M-8-1. cat /proc/partitions command

```

root@ccpe999904:/# cat /proc/partitions
major minor #blocks name

 1         0    48000 ram0
31         0     3968 mtdblock0
31         1         64 mtdblock1
31         2         64 mtdblock2
179        0   7636800 mmcblk0
179        1   7635776 mmcblk0p1
 8         0   7843840 sda
 8         1   7839808 sda1
 8        16  15642624 sdb
 8        17  15642568 sdb1
root@ccpe999904:/#

```



major	minor	#blocks	name	Label
1	0	48000	ram0	
31	0	3968	mtdblock0	
31	1	64	mtdblock1	
31	2	64	mtdblock2	
179	0	7636800	mmcblk0	
179	1	7635776	mmcblk0p1	
8	0	7843840	sda	USB2.0 Flash disk
8	1	7839808	sda1	
8	16	15642624	sdb	USB3.0 Flash disk
8	17	15642568	sdb1	

## M-8-2. fdisk -l command

```

root@ccpe999904:/# fdisk -l
Disk /dev/ram0: 46.9 MiB, 49152000 bytes, 96000 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: 7.3 GiB, 7820083200 bytes, 15273600 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

Device          Boot Start      End  Sectors  Size Id Type
/dev/mmcblk0p1 *    2048 15273599 15271552   7.3G 83 Linux
    
```



**Disk /dev/sda: 7.5 GiB, 8032092160 bytes, 15687680 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: 0x49cd83fb

Device	Boot Start	End	Sectors	Size	Id	Type
/dev/sda1	8064	15687679	15679616	7.5G	b	W95 FAT32

**Disk /dev/sdb: 14.9 GiB, 16018046976 bytes, 31285248 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: 0xc3072e18

Device	Boot Start	End	Sectors	Size	Id	Type
/dev/sdb1	112	31285247	31285136	14.9G	c	W95 FAT32 (LBA)

```
root@ccpe999904:/# ^C
root@ccpe999904:/# ^C
root@ccpe999904:/# ^C
```

## M-9. Top command

```

top - 07:49:19 up 3:26, 1 user, load average: 0.12, 0.03, 0.01
Tasks: 101 total, 1 running, 53 sleeping, 0 stopped, 0 zombie
%Cpu(s): 0.2 us, 0.7 sy, 0.0 ni, 98.5 id, 0.0 wa, 0.5 hi, 0.2 si, 0.0 st
KiB Mem : 1016520 total, 802112 free, 61464 used, 152944 buff/cache
KiB Swap: 0 total, 0 free, 0 used. 882556 avail Mem

  PID USER      PR  NI   VIRT   RES   SHR  S  %CPU  %MEM     TIME+ COMMAND
 3975 root        20   0   7672   3364  2780  R   1.3   0.3   0:00.42 top
 1060 root        20   0     0     0     0  S   0.7   0.0   0:44.86 d0032004.m+
   19 root         0 -20     0     0     0  I   0.3   0.0   0:02.33 kworker/1:+
    1 root        20   0 160700  7808  5796  S   0.0   0.8   0:03.14 systemd
    2 root        20   0     0     0     0  S   0.0   0.0   0:00.04 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   0:00.14 ksoftirqd/0
   10 root        20   0     0     0     0  I   0.0   0.0   0:00.32 rcu_preempt
   11 root        20   0     0     0     0  I   0.0   0.0   0:00.02 rcu_sched
   12 root        20   0     0     0     0  I   0.0   0.0   0:00.00 rcu_bh
   13 root        rt    0     0     0     0  S   0.0   0.0   0:00.01 migration/0
   14 root        20   0     0     0     0  S   0.0   0.0   0:00.00 cpuhp/0
   15 root        20   0     0     0     0  S   0.0   0.0   0:00.00 cpuhp/1
   16 root        rt    0     0     0     0  S   0.0   0.0   0:00.01 migration/1
   17 root        20   0     0     0     0  S   0.0   0.0   0:00.02 ksoftirqd/1
    
```

=== End of File ===