

# ESPRESSObin- Quick Start Guide

V1.0- Aug 03, 2016

V1.1- Aug 11, 2016

V1.2- Feb 02, 2017

V2.0- Apr 11, 2018 – based on V7 board

V3.0- Sep 19, 2018 – based on V7 board

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Globalscale Technologies announces the new version of ESPRESSObin with enclosure besides the original PCBA version, this Quick Start Guide includes both versions.

## A. Appearance



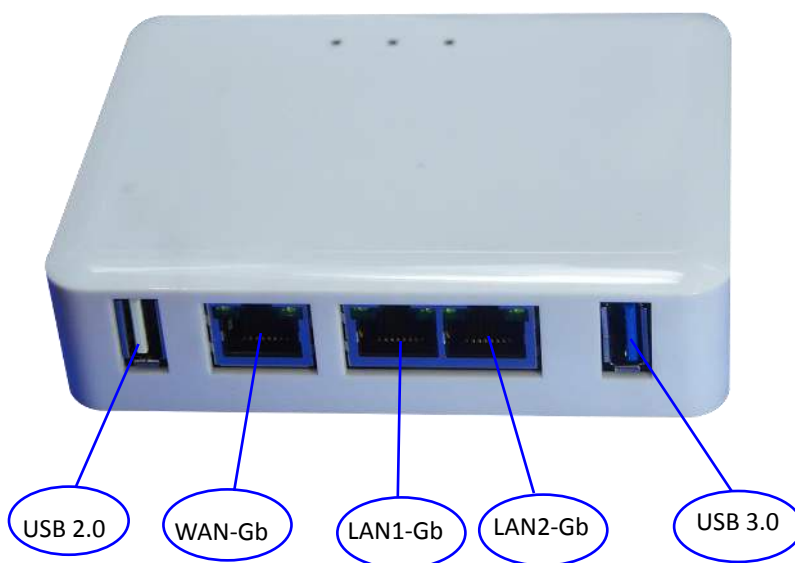
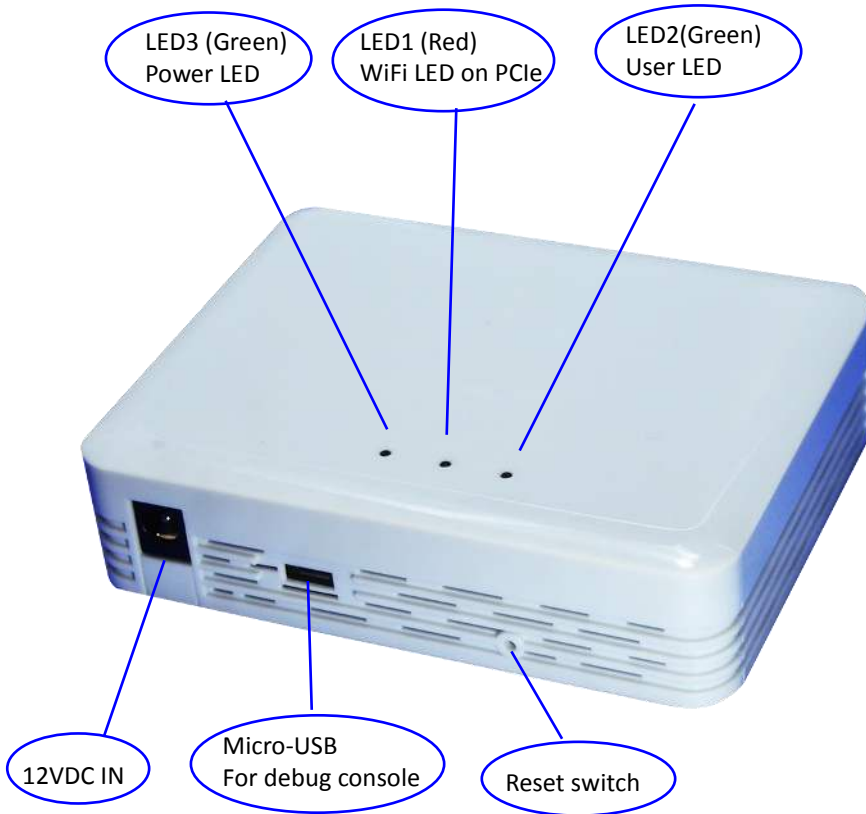
## B. Package contents

	ESPRESSObin content List		Remark
1	ESPRESSObin board	1 unit	ESPRESSObin main unit with or without enclosure
2	AC to DC 12V Power Adapter	1 pc	Input 90-240VAC / output 12V,2A DC
3	Ethernet Cable	2 pc	Cat 5e
4	USB3.0 Cable	1 pc	
5	USB to Micro-USB Cable	1 pc	For debug console use
6	Warranty card	1 pc	



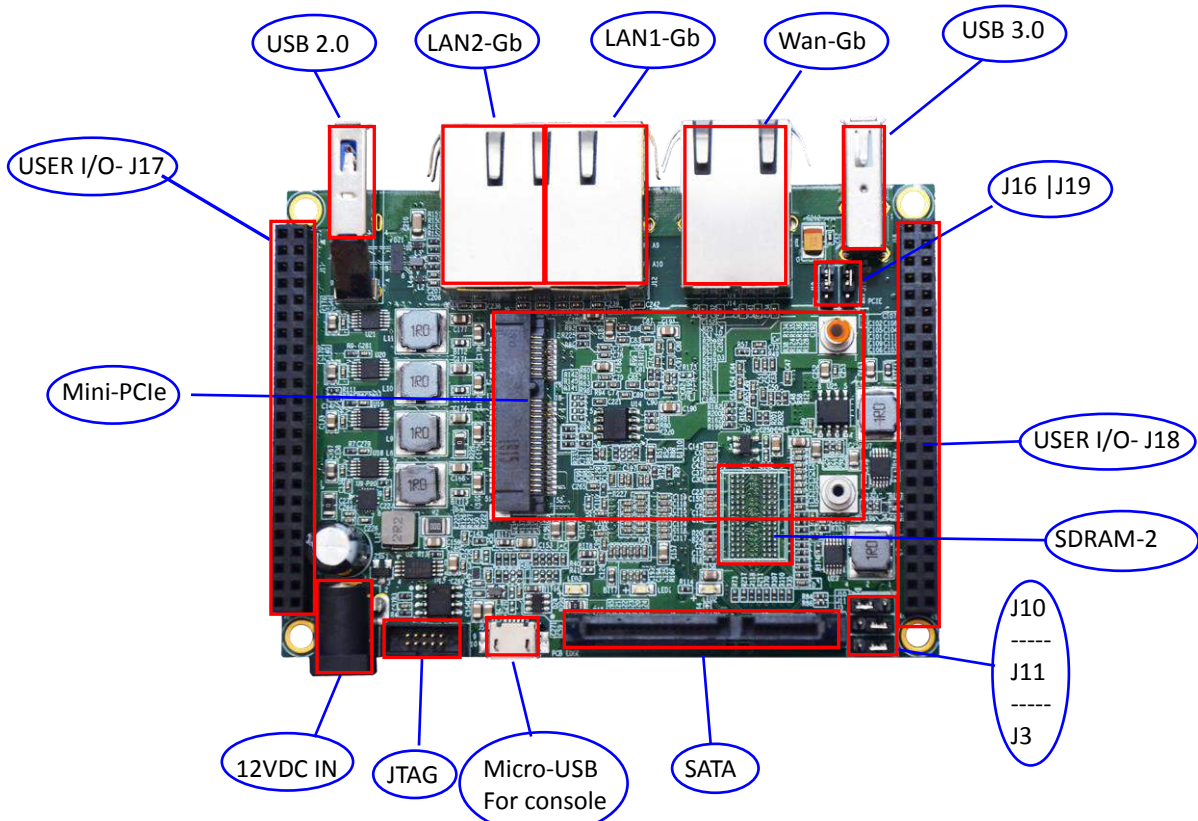
## C. I/O ports and connectors

### 1. With enclosure

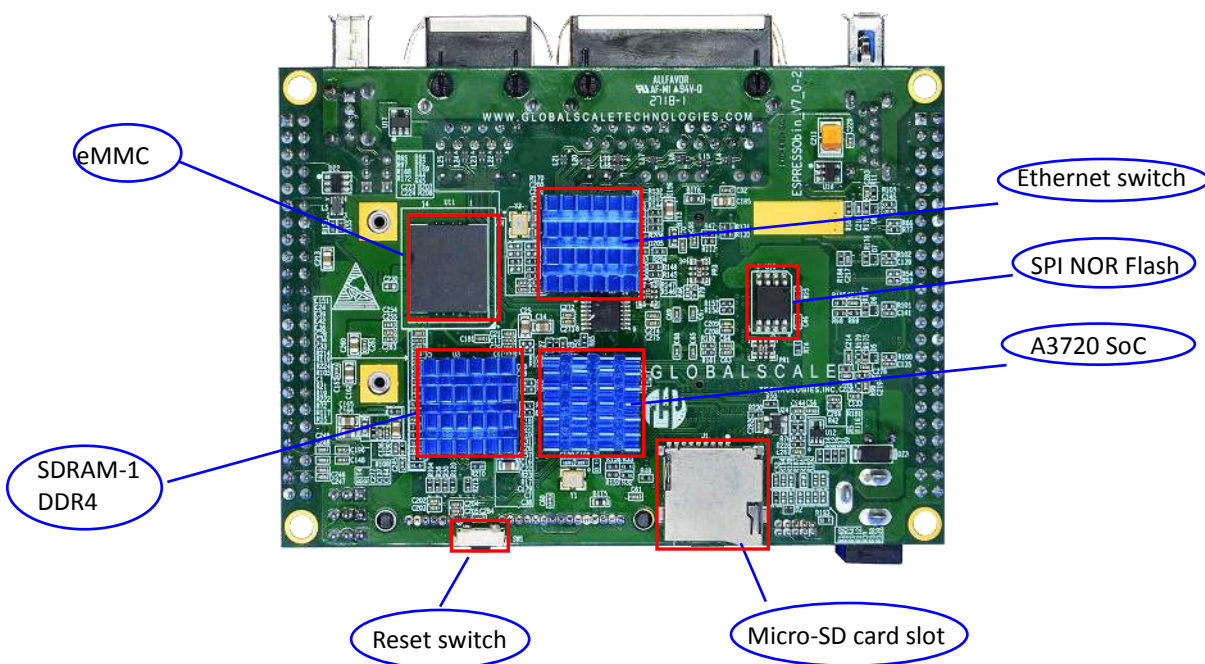


## 2. PCBA

### a. Top view



### b. Bottom view



## D. Preparation before power on

### 1. Hardware:

- a. Linux PC installed with minicom, putty or Windows PC installed with putty
- b. ESPRESSObin unit or PCBA
- c. IP router or IP switch (optional)
- d. USB3.0 Flash disk (optional)
- e. SATA HDD (optional)

### 2. Software:

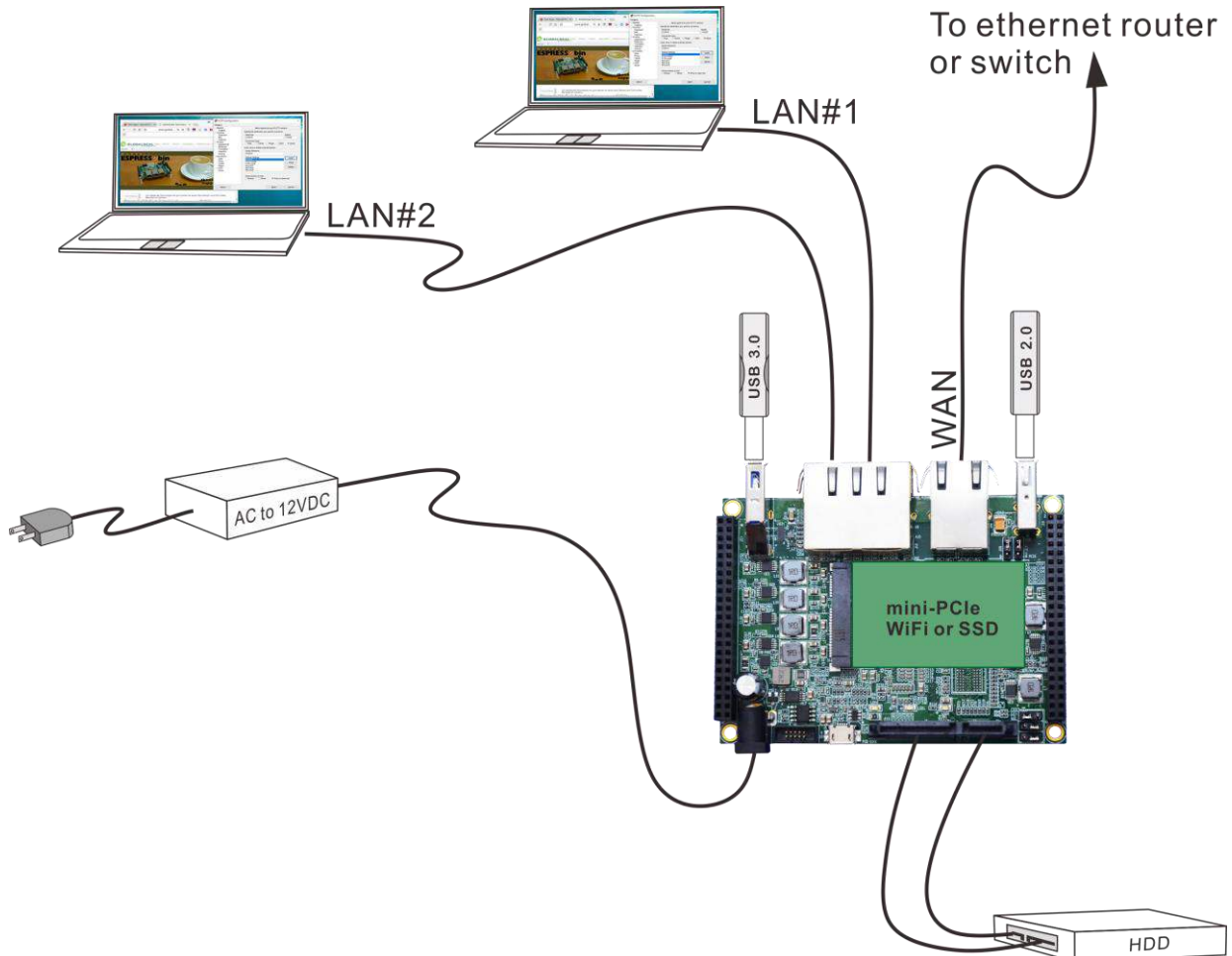
- a. Putty for linux or Windows PC  
Go on web and download putty.exe
- b. FTDI driver for linux or Windows PC  
FTDI driver has already been pre-installed in the ESPRESSObin.  
Go to the following website, download then install FTDI driver on your Windows PC.

<http://domoticx.com/pl2303-usb-to-uart-bridge-drivers-windows/>

Visit the following web site for more information

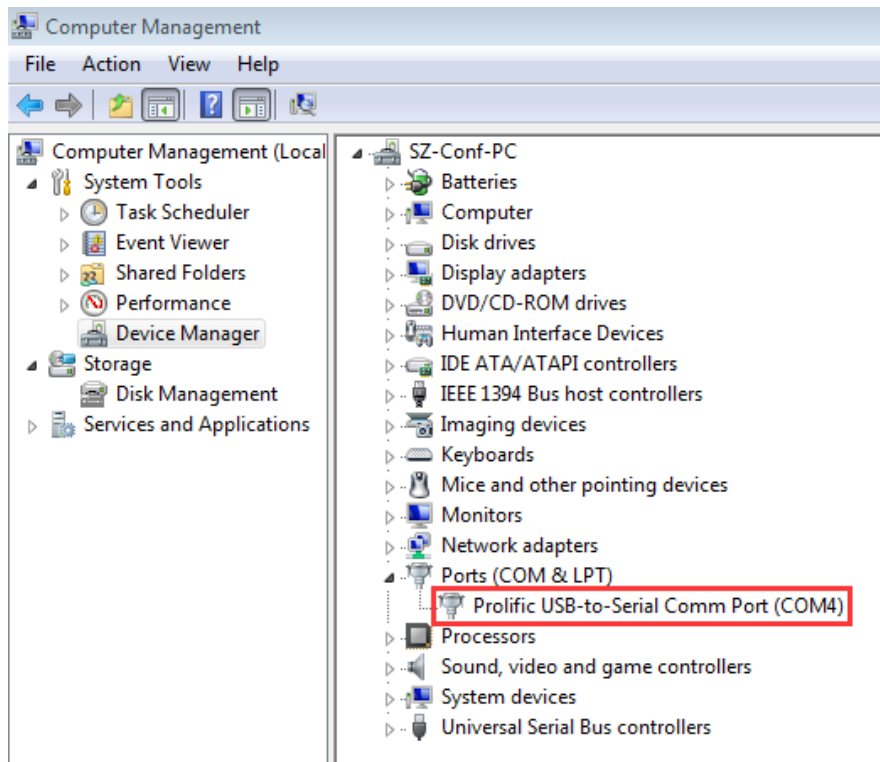
<http://www.globalscaletechnologies.com/t-downloads.aspx>

## E. Connection:

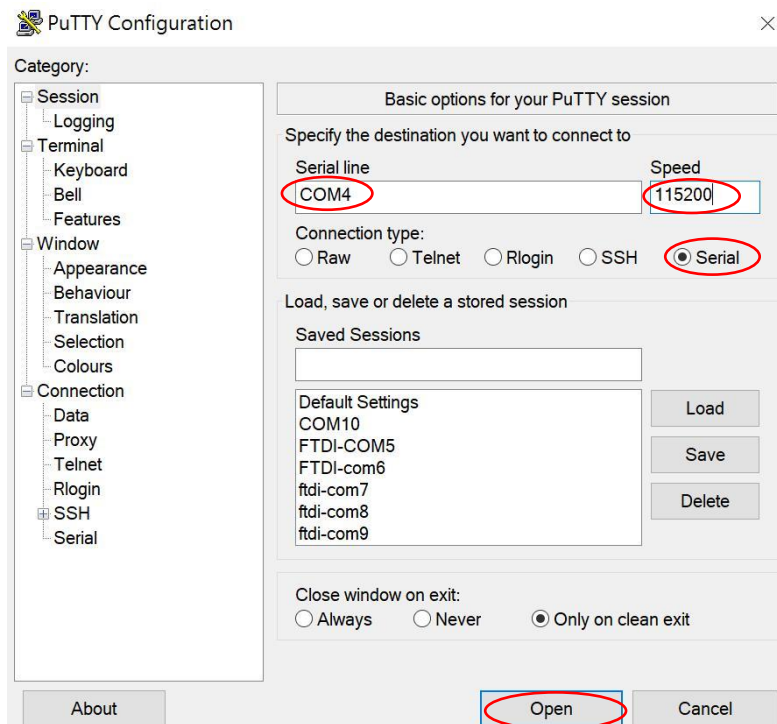


## F. Find com port and connect with putty

1. Connect ESPRESSObin'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 input the COM port you've found in previous step, The baud rate speed is 115200 then press "open"





## G. Start running ESPRESSObin

### 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 2017.03-armada-17.10.2-g14aeedc (Jun 01 2018 - 15:39:10 +0800)

Model: Marvell Armada 3720 Community Board ESPRESSObin
CPU @ 1000 [MHz]
L2 @ 800 [MHz]
TClock @ 200 [MHz]
DDR @ 800 [MHz]
DRAM: 1 GiB
U-Boot DT blob at : 000000003f7161b8
Comphy-0: USB3 5 Gbps
Comphy-1: PEX0 2.5 Gbps
Comphy-2: SATA0 6 Gbps
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 down
MMC: sdhci@d0000: 0, sdhci@d8000: 1
SF: Detected mx25u3235f with page size 256 Bytes, erase size 64 KiB, total 4 MiB
Net: eth0: neta@30000 [PRIME]
Hit any key to stop autoboot: 0
Marvell>>
    
```

Enter boot command or press reset key to reboot the system

```
Marvell>> boot
```

You will see the “~#” prompt after system is up, means you have been logged as the root user which is the super user,

Enter “pwd” shows you are under the “/root” directory, enter “whoami” shows “root”.

```

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

## 2. Check the kernel version

Enter command : `uname -a`

```
root@espressobin:~# uname -a
Linux espressobin 4.4.52-armada-17.10.3-g9095f3a #132 SMP PREEMPT Thu May 31 11:13:10
CST 2018 aarch64 aarch64 aarch64 GNU/Linux
root@espressobin:~#
root@espressobin:~#
```

## 3. Check the CPU information

Type in “`cat /proc/cpuinfo`”

You may see there are 2 processors

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

root@espressobin:~#
```

```
root@espressobin:~#
root@espressobin:~# 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
CPU max MHz: 1000.0000
CPU min MHz: 200.0000
Hypervisor vendor: (null)
Virtualization type: full
root@espressobin:~#
```

#### 4. Check the Ethernet connection

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

```

root@espressobin:~# ifconfig
bond0    Link encap:Ethernet  HWaddr 72:0d:c7:40:1b:4b
          UP BROADCAST MASTER MULTICAST  MTU:1500  Metric:1
          RX packets:0 errors:0 dropped:0 overruns:0 frame:0
          TX packets:0 errors:0 dropped:0 overruns:0 carrier:0
          collisions:0 txqueuelen:1000
          RX bytes:0 (0.0 B)  TX bytes:0 (0.0 B)

br0      Link encap:Ethernet  HWaddr 02:ad:4e:06:e0:70
          inet addr:192.168.84.1  Bcast:192.168.84.255  Mask:255.255.255.0
          inet6 addr: fe80::ad:4eff:fe06:e070/64 Scope:Link
          UP BROADCAST RUNNING MULTICAST  MTU:1500  Metric:1
          RX packets:23407 errors:0 dropped:0 overruns:0 frame:0
          TX packets:28121 errors:0 dropped:0 overruns:0 carrier:0
          collisions:0 txqueuelen:1000
          RX bytes:3344054 (3.3 MB)  TX bytes:26443145 (26.4 MB)

eth0     Link encap:Ethernet  HWaddr f0:ad:4e:06:e0:70
          inet6 addr: fe80::f2ad:4eff:fe06:e070/64 Scope:Link
          UP BROADCAST RUNNING PROMISC MULTICAST  MTU:1500  Metric:1
          RX packets:53806 errors:0 dropped:0 overruns:0 frame:0
          TX packets:50755 errors:0 dropped:0 overruns:0 carrier:0
          collisions:0 txqueuelen:532
          RX bytes:30570526 (30.5 MB)  TX bytes:30262432 (30.2 MB)
          Interrupt:106
    
```

```

lan0     Link encap:Ethernet  HWaddr 02:ad:4e:06:e0:70
          inet6 addr: fe80::ad:4eff:fe06:e070/64 Scope:Link
          UP BROADCAST RUNNING MULTICAST  MTU:1500  Metric:1
          RX packets:13003 errors:0 dropped:0 overruns:0 frame:0
          TX packets:15033 errors:0 dropped:0 overruns:0 carrier:0
          collisions:0 txqueuelen:1000
          RX bytes:2493576 (2.4 MB)  TX bytes:7629474 (7.6 MB)

lan1     Link encap:Ethernet  HWaddr 12:ad:4e:06:e0:70
          inet6 addr: fe80::10ad:4eff:fe06:e070/64 Scope:Link
          UP BROADCAST RUNNING MULTICAST  MTU:1500  Metric:1
          RX packets:10404 errors:0 dropped:0 overruns:0 frame:0
          TX packets:16437 errors:0 dropped:0 overruns:0 carrier:0
          collisions:0 txqueuelen:1000
          RX bytes:850478 (850.4 KB)  TX bytes:19253684 (19.2 MB)

lo       Link encap:Local Loopback
          inet addr:127.0.0.1  Mask:255.0.0.0
          inet6 addr: ::1/128 Scope:Host
          UP LOOPBACK RUNNING  MTU:65536  Metric:1
          RX packets:2467 errors:0 dropped:0 overruns:0 frame:0
          TX packets:2467 errors:0 dropped:0 overruns:0 carrier:0
          collisions:0 txqueuelen:1
          RX bytes:183448 (183.4 KB)  TX bytes:183448 (183.4 KB)

wan      Link encap:Ethernet  HWaddr f0:ad:4e:06:e0:70
          inet addr:192.168.3.17  Bcast:192.168.3.255  Mask:255.255.255.0
          inet6 addr: fe80::f2ad:4eff:fe06:e070/64 Scope:Link
          UP BROADCAST RUNNING MULTICAST  MTU:1500  Metric:1
          RX packets:30399 errors:0 dropped:0 overruns:0 frame:0
          TX packets:19149 errors:0 dropped:0 overruns:0 carrier:0
          collisions:0 txqueuelen:1000
          RX bytes:26257964 (26.2 MB)  TX bytes:3132374 (3.1 MB)
    
```

```

root@espressobin:~# ping www.google.com
PING www.google.com (108.177.97.103) 56(84) bytes of data.
64 bytes from tm-in-f103.1e100.net (108.177.97.103): icmp_seq=1 ttl=40 time=47.0 ms
64 bytes from tm-in-f103.1e100.net (108.177.97.103): icmp_seq=2 ttl=40 time=133 ms
64 bytes from tm-in-f103.1e100.net (108.177.97.103): icmp_seq=3 ttl=40 time=49.7 ms
64 bytes from tm-in-f103.1e100.net (108.177.97.103): icmp_seq=4 ttl=40 time=41.3 ms
^C
--- www.google.com ping statistics ---
4 packets transmitted, 4 received, 0% packet loss, time 3004ms
rtt min/avg/max/mdev = 41.346/67.994/133.851/38.142 ms
root@espressobin:~#
    
```

## 5. Check USB connection

Enter command: lsusb

Here are two USB flash devices found.

```

root@espressobin:~# lsusb
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 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 007: ID 05dc:a838 Lexar Media, Inc.
Bus 002 Device 001: ID 1d6b:0002 Linux Foundation 2.0 root hub
root@espressobin:~#
    
```

# fdisk -l

```

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: 0x00000000

Device            Boot Start          End  Sectors  Size Id Type
/dev/sdb1         *      220928 31285247 31064320 14.8G  c W95 FAT32 (LBA)
root@espressobin:~#
    
```

## 6. Check micro- SD card

insert micro-SD card then enter command “fdisk -l”

```

Disk /dev/mmcblk1: 60.1 GiB, 64490569728 bytes, 125958144 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: 0x2c3e45a6

Device            Boot Start      End  Sectors  Size Id Type
/dev/mmcblk1p1    *          32768 125958143 60G  7 HPFS/NTFS/exFAT
root@espressobin:~#

```

## 7. Check SATA HDD

Connect 160GB SATA HDD then enter command “fdisk -l”

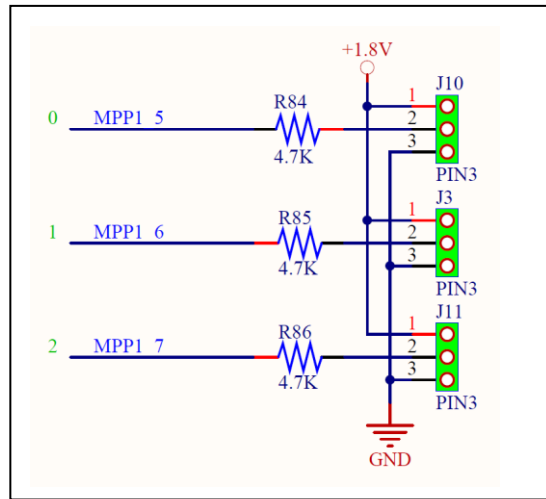
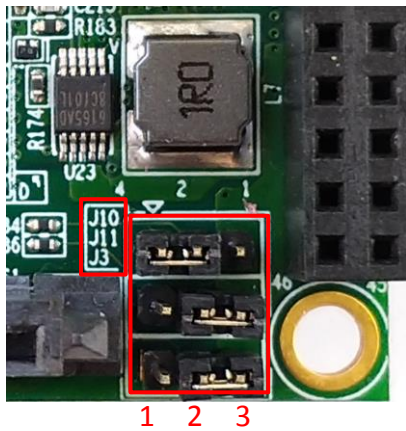
```

Disk /dev/sdb: 149.1 GiB, 160041885696 bytes, 312581808 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: 0x4e748d06

Device            Boot  Start      End  Sectors  Size Id Type
/dev/sdb1          *          1    48194    48194   23.5M 83 Linux
/dev/sdb2          48195    6040439  5992245    2.9G 83 Linux
/dev/sdb3          6040440 312576704 306536265 146.2G 83 Linux

```

## H. Boot device options



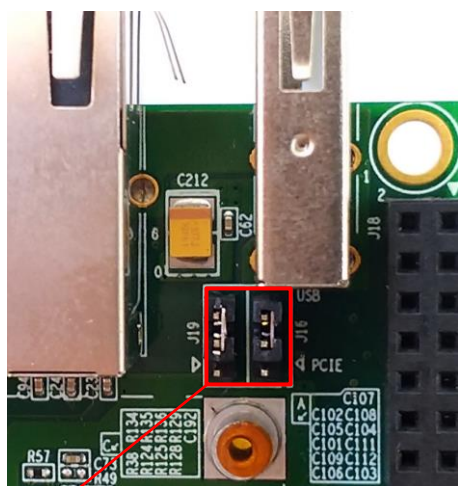
ESPRESSObin supports boot up from different devices, see tables below

ESPRESSObin boot mode	MPP1_7 (J11)	MPP1_6 (J3)	MPP1_5 (J10)
Serial NOR Flash Download Mode	0	0	1
eMMC Download Mode	0	1	0
eMMC Alternate Download Mode	0	1	1
SATA Download Mode	1	0	0
Serial NAND Flash Download Mode	1	0	1
UART Mode	1	1	0
SD card	1	1	1

MPP1_5	0	J10 in position 2-3
	1	J10 in position 1-2
MPP1_6	0	J3 in position 2-3
	1	J3 in position 1-2
MPP1_7	0	J11 in position 2-3
	1	J11 in position 1-2

## I. USB2.0 selection

The PCIe connector J9 and USB type A connector J8 share the same USB2.0 signals. Only one can be used at the same time, please select as followings.



Pin1

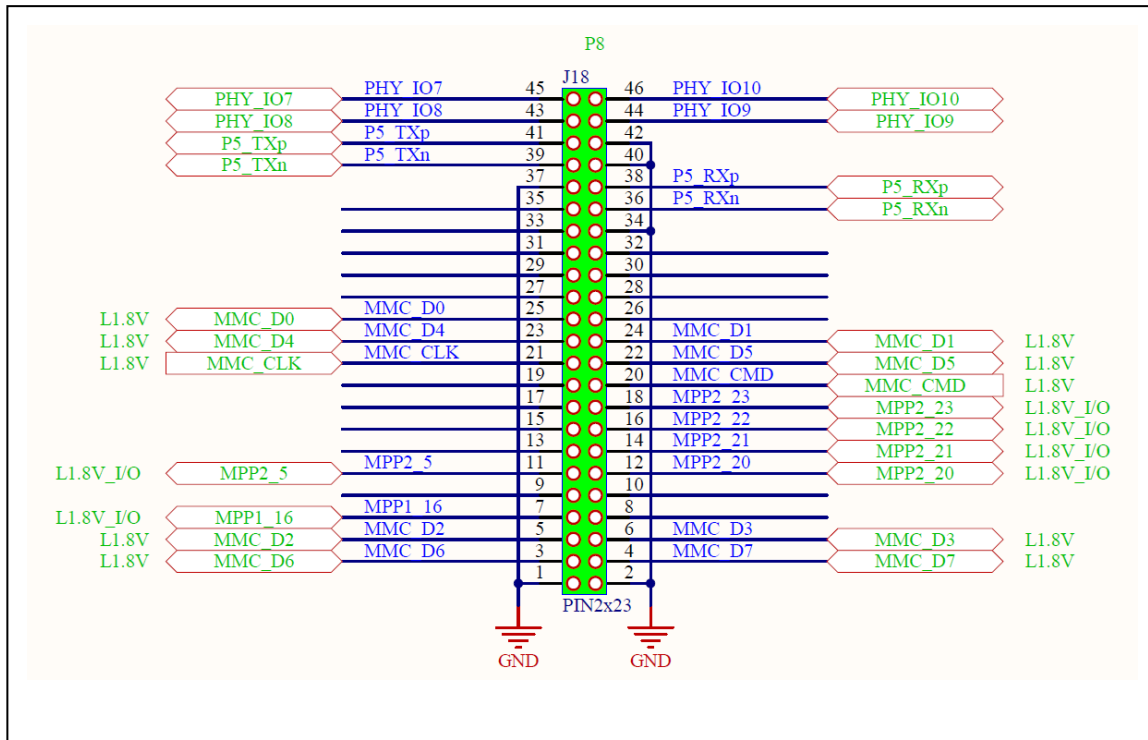
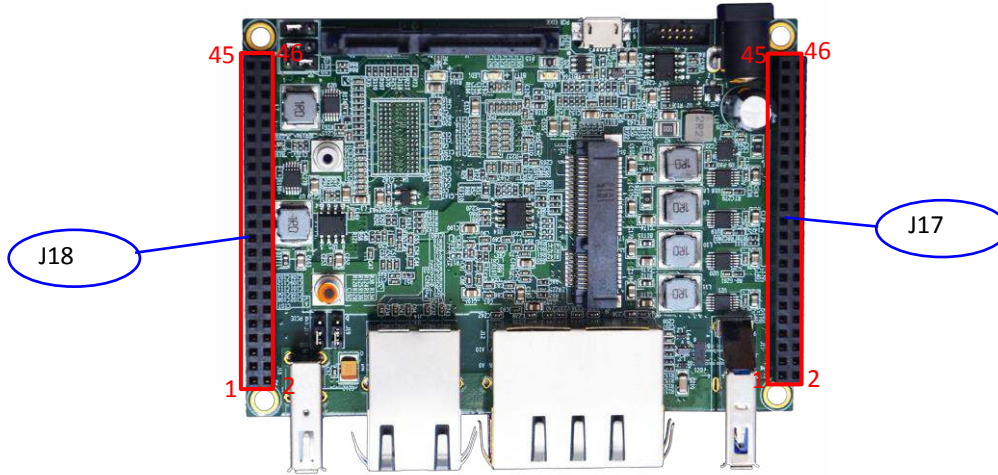
Both J16 and J19	Jump in 1-2	USB2.0 goes to J9, PCIe connector
	Jump in 2-3	USB2.0 goes to J8, USB type A connector

## J. I2C I/O power rail on user Port J17

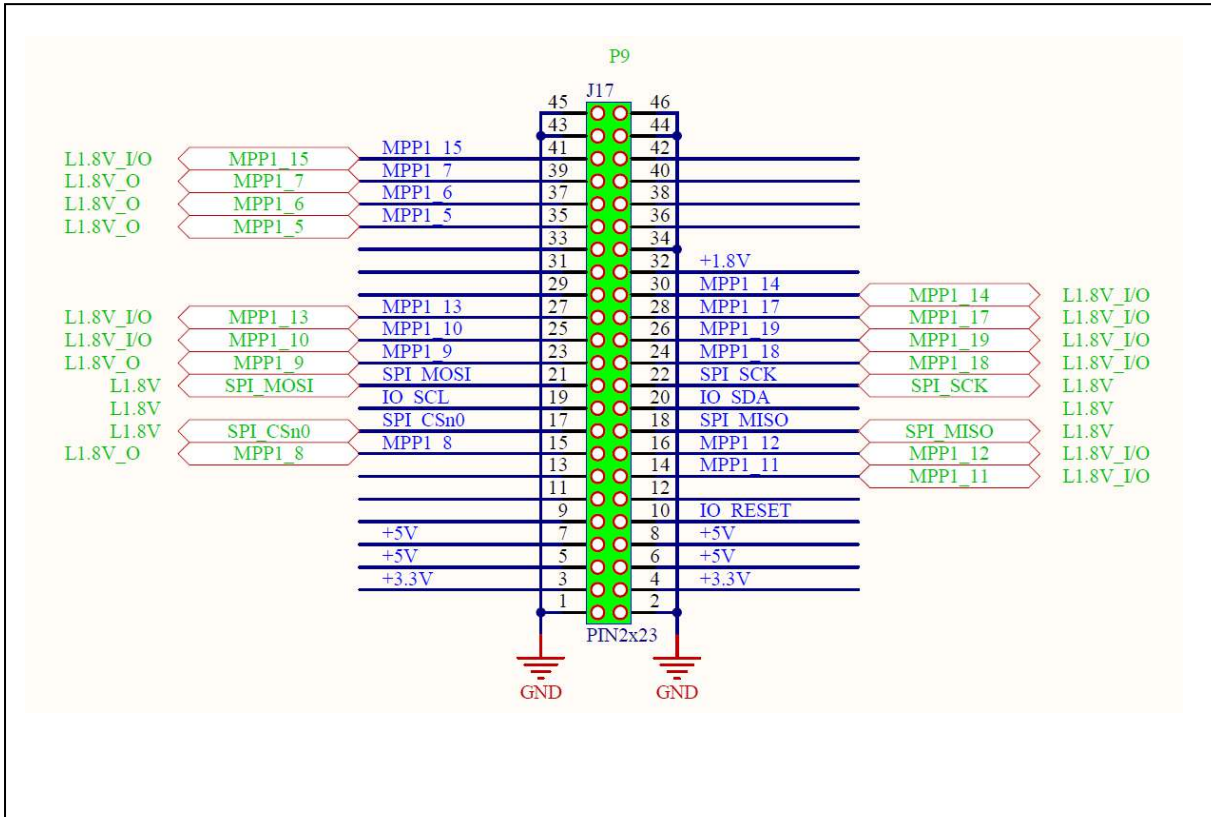
I2C signals have been brought to user I/O connector J17 and the power rail can be configured as 1.8V (default) or 3.3V , set as followings.

I2C signals	Power rail	R53, R54	R78, R111	
IO_SDA (J17, Pin20)	1.8V I/O	Do not populate	22 ohm	default
IO_SCL (J17, Pin19)	3.3V I/O	22 ohm	Do not populate	

## K. USER I/O -J17 and J18







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