

DDK

Quick Start



DDK Design sketch



This device complies with part 15 of the FCC Rules. Operation is subject to the condition that this device does not cause harmful interference (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.

NOTE: 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:

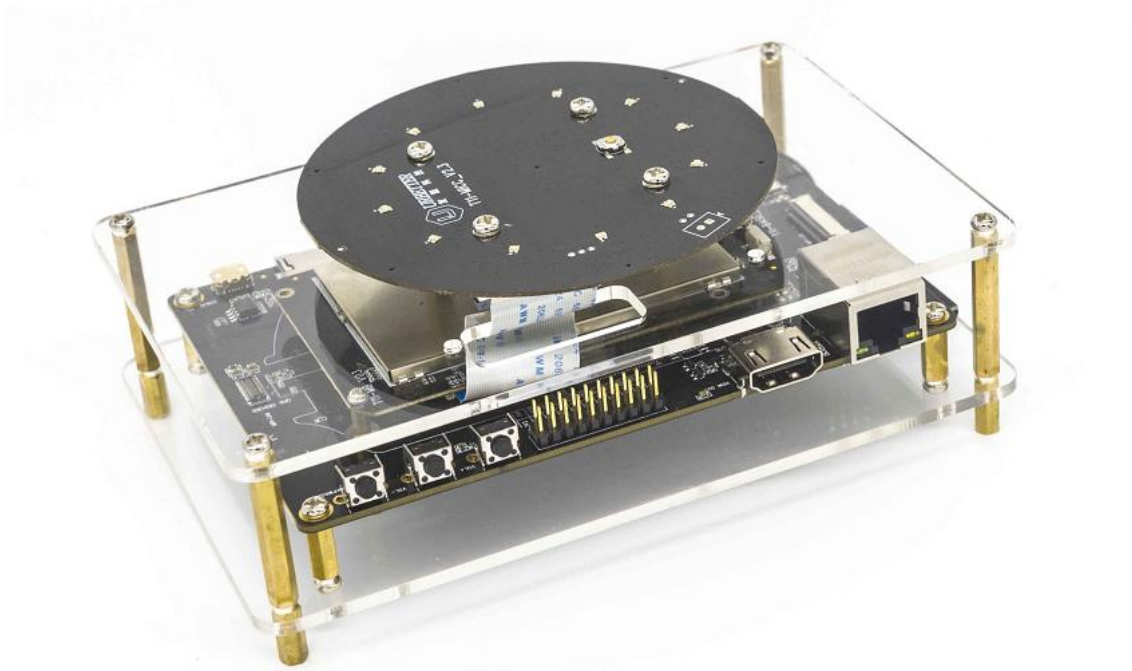
- Reorient or relocate the receiving antenna.
- Increase the separation between the equipment and receiver.
- Connect the equipment into an outlet on a circuit different from that to which the receiver is connected.
- Consult the dealer or an experienced radio/TV technician for help.

To maintain compliance with FCC's RF Exposure guidelines, This equipment should be installed and operated with minimum distance between 20cm the radiator your body: Use only the supplied antenna.

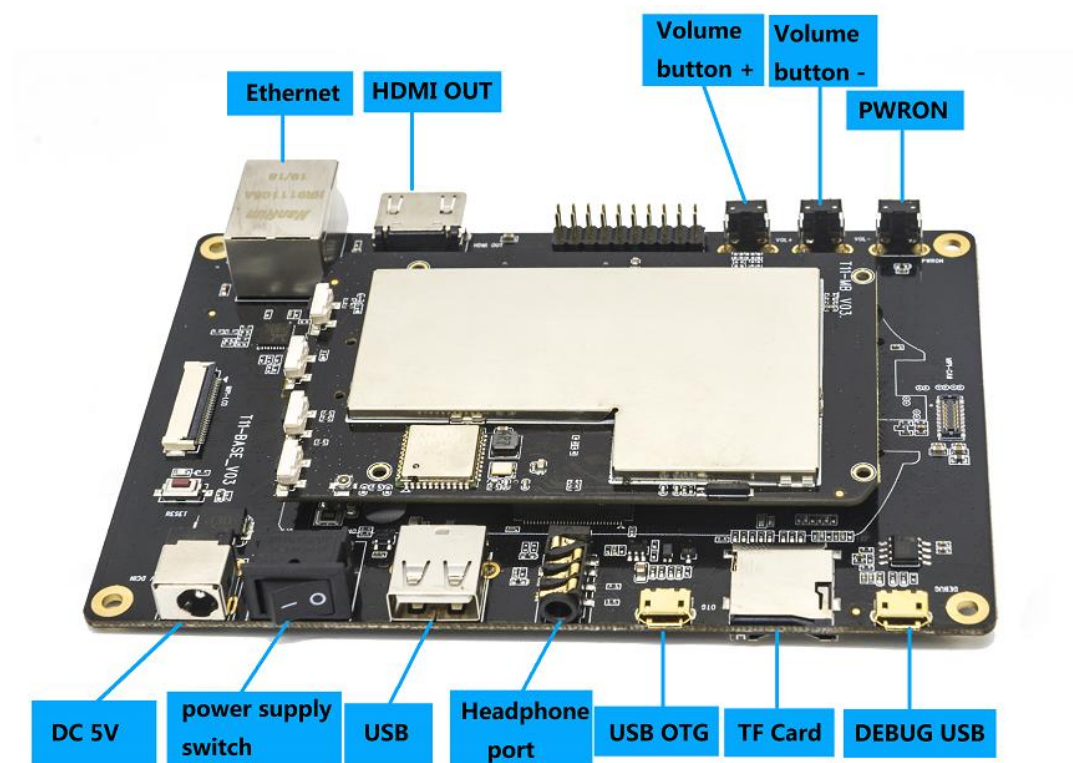
FCC ID: **2AUX5-DDK**.

Development Board Hardware Resources

1.1 Hardware Interface Description



1.2 DDK Development Board Main Board Interface Diagram:

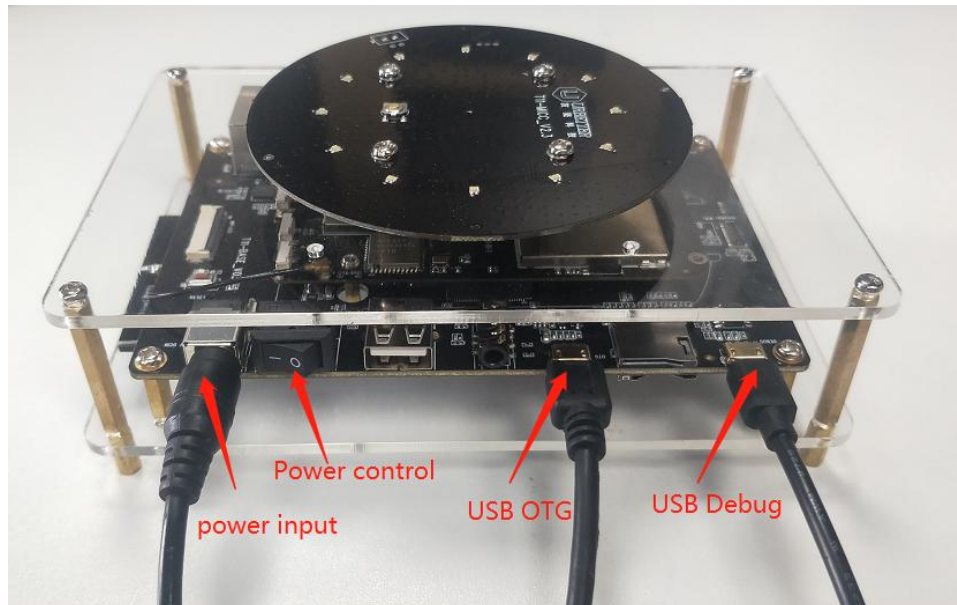


1.3 Hardware Interface Description

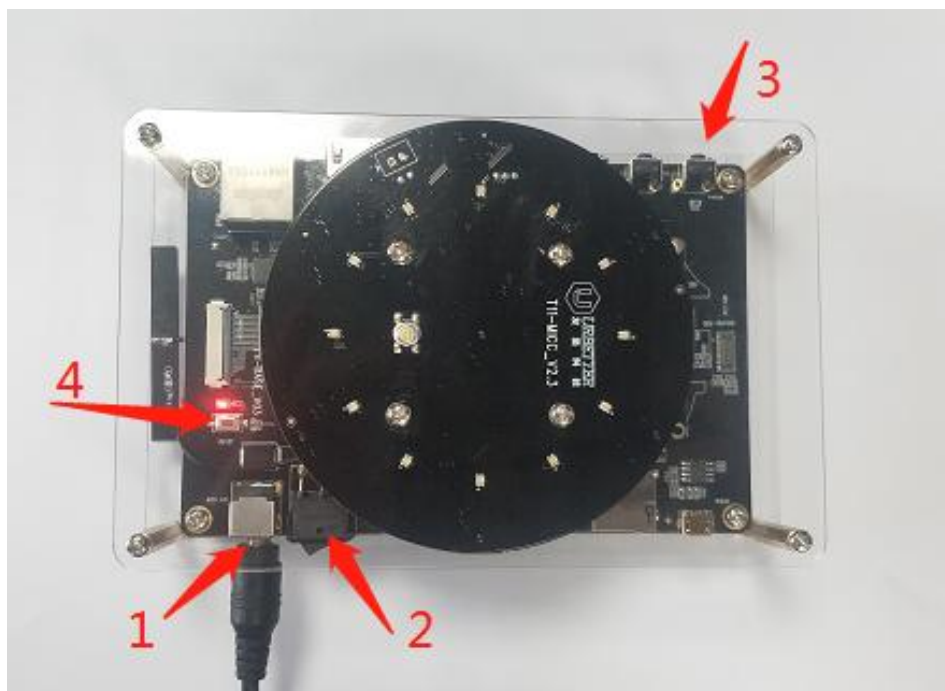
- 1、The development kit has two power input. The left connector is to power the

development kit and is highlighted as Power in the image below. The right one is to control it on/off.

2、The development kit has two micro USB connectors. The left connector is to USB OTG download update image in the image below. To control the development kit connect the debug port to a computer by using the right micro USB cable. It is essential to use a high quality cable to ensure reliable communications.



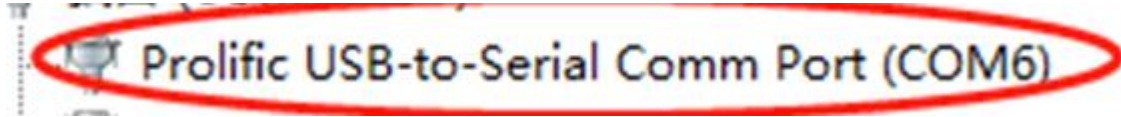
Boot-on sequence:1-2-3-4 in the image below.



1.4 Instructions for debugging serial ports

(1) Install XSHELL 6 on PC (self-installing serial port tool);

- (2) Connect USB debug and PC on development board through MICRO USB cable;
- (3) After power on the development board, install the driver at the prompt of the system;
- (4) On the PC, right-click My PC/Device Manager/Port to see the port number of the serial port, as shown below:



- (5) Open the XSHELL tool and set serial port parameters:

The following settings are made in turn: click on the file, create a new one, select SERIAL in the pop-up dialog box, and click "SERIAL" on the left to set it in turn.:

Port: COM6 (Port Number Displayed in Device Manager) ;

Baud Rate: 115200 ;

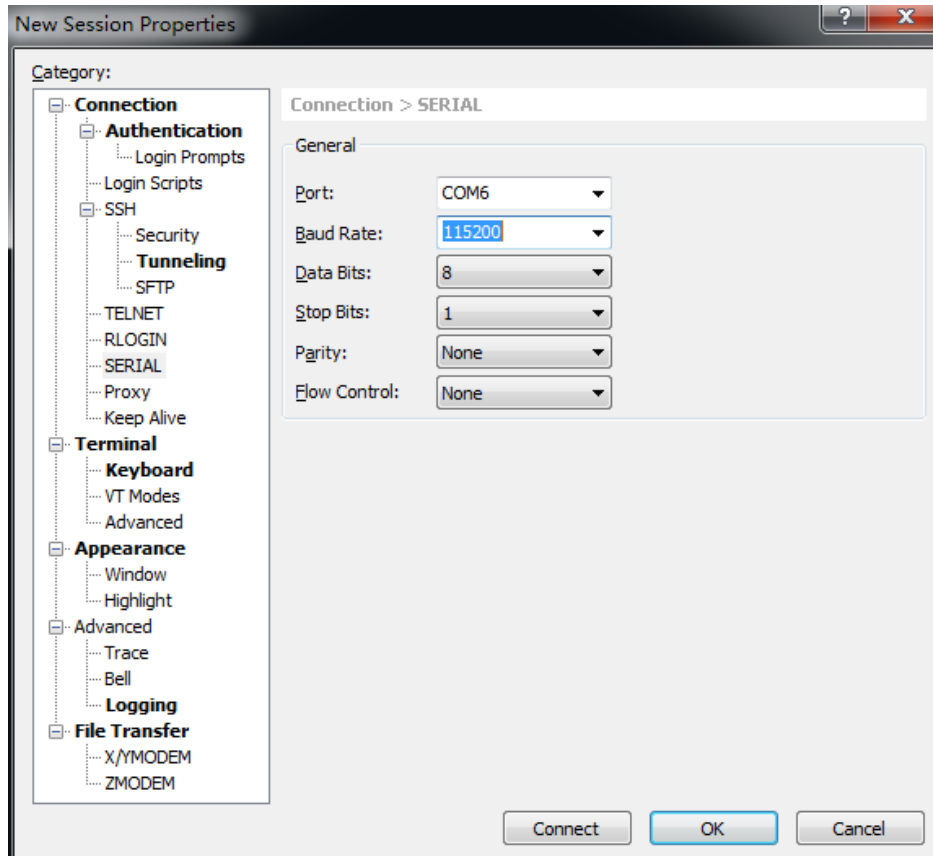
Data Bits: 8;

Stop Bits: 1;

Parity: None;

Flow Control: None;

Once set up, click on the link:



```
[root@px30_64:/]#
[root@px30_64:/]#
[root@px30_64:/]#
[root@px30_64:/]#
[root@px30_64:/]#
[root@px30_64:/]#
[root@px30_64:/]#
[root@px30_64:/]#
[root@px30_64:/]#
[root@px30_64:/]#
```

Note: After each power cut, you need to disconnect and connect the XSHELL to reprint the log.

1.5 USING ADB

1.5.1 Install XSHELL 6 on PC (self-installing serial port tool);

1.5.2 Software usage

(1) After downloading, open and configure it as follows:

Connect the serial port using micro USB on the core board:

①View IP Information of Development Board Network:

wifi ip info:

```
[root@px30_64:~]# ifconfig
eth0      Link encap:Ethernet  HWaddr 16:F9:AB:1C:3D:BF
          UP BROADCAST MULTICAST  MTU:1500  Metric:1
          RX packets:0 errors:0 dropped:0 overruns:0 frame:0
          TX packets:2 errors:0 dropped:0 overruns:0 carrier:0
          collisions:0 txqueuelen:1000
          RX bytes:0 (0.0 B)  TX bytes:168 (168.0 B)
          Interrupt:24

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:0 errors:0 dropped:0 overruns:0 frame:0
          TX packets:0 errors:0 dropped:0 overruns:0 carrier:0
          collisions:0 txqueuelen:1
          RX bytes:0 (0.0 B)  TX bytes:0 (0.0 B)

wlan0     Link encap:Ethernet  HWaddr 10:D0:7A:5D:CD:24
          inet addr:192.168.11.10  Bcast:192.168.11.255  Mask:255.255.255.0
          inet6 addr: fe80::094a:c1ca:6abd:4d4d/64 Scope:Link
          UP BROADCAST RUNNING MULTICAST  MTU:1500  Metric:1
          RX packets:603 errors:0 dropped:1 overruns:0 frame:0
          TX packets:277 errors:0 dropped:0 overruns:0 carrier:0
          collisions:0 txqueuelen:1000
          RX bytes:104840 (102.3 KiB)  TX bytes:56060 (54.7 KiB)
```

or, ethernet ip info:

```
[root@px30_64:~]# ifconfig
eth0      Link encap:Ethernet  HWaddr 16:F9:AB:1C:3D:BF
          inet addr:192.168.1.123  Bcast:192.168.1.255  Mask:255.255.255.0
          inet6 addr: fe80::7338:bcac:d12b:4baa/64 Scope:Link
          UP BROADCAST RUNNING MULTICAST  MTU:1500  Metric:1
          RX packets:2316 errors:0 dropped:0 overruns:0 frame:0
          TX packets:135 errors:0 dropped:0 overruns:0 carrier:0
          collisions:0 txqueuelen:1000
          RX bytes:175951 (171.8 KiB)  TX bytes:18272 (17.8 KiB)
          Interrupt:24

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:2 errors:0 dropped:0 overruns:0 frame:0
          TX packets:2 errors:0 dropped:0 overruns:0 carrier:0
          collisions:0 txqueuelen:1
          RX bytes:118 (118.0 B)  TX bytes:118 (118.0 B)
```

②Add a password to the machine: (If no password is set, you will not be able to log on to the development board.)

```
[root@px30_64:~]# passwd root
Changing password for root
New password:
Bad password: too weak
Retype password:
passwd: password for root changed by root
[root@px30_64:~]#
```

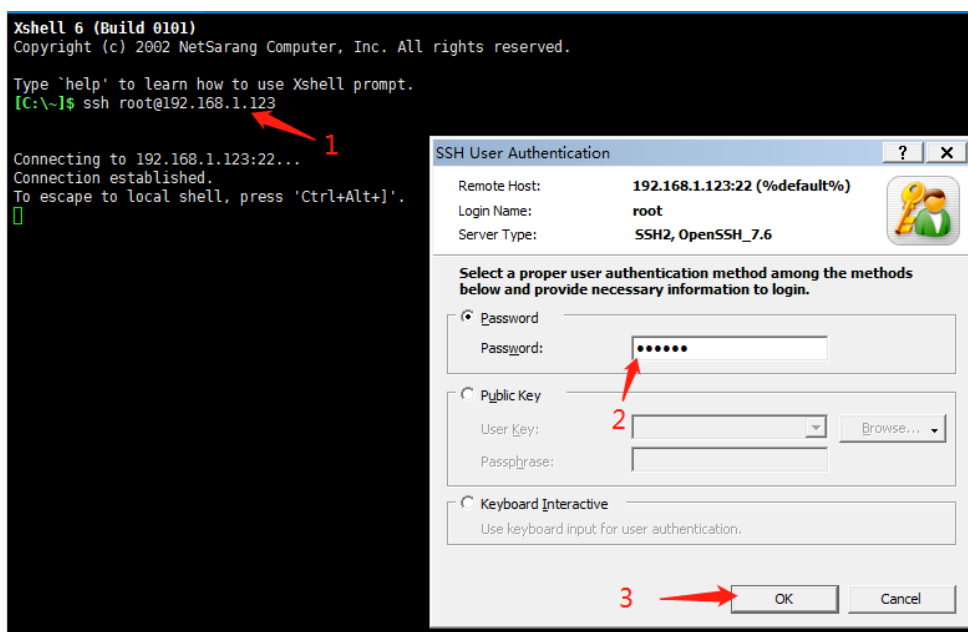
③Create a new window in the xshell tool, input new command: ssh root@192.168.11.10
Enter ADB shell:

```
Type 'help' to learn how to use Xshell prompt.
[C:\~]$ ssh root@192.168.1.123

Connecting to 192.168.1.123:22...
Connection established.
To escape to local shell, press 'Ctrl+Alt+.`'.

WARNING! The remote SSH server rejected X11 forwarding request.
[root@px30_64:~]#
[root@px30_64:~]#
[root@px30_64:~]#
[root@px30_64:~]#
```

input the password you just set:



click OK enter:

```
Xshell 6 (Build 0101)
Copyright (c) 2002 NetSarang Computer, Inc. All rights reserved.

Type 'help' to learn how to use Xshell prompt.
[!C:\~!$ ssh root@192.168.1.123

Connecting to 192.168.1.123:22...
Connection established.
To escape to local shell, press 'Ctrl+Alt+!'.

WARNING! The remote SSH server rejected X11 forwarding request.
[root@px30_64:~]#
[root@px30_64:~]#
[root@px30_64:~]#
```

2 Test example

2.1 WIFI Connect

Using ADB putty to connect wifi, WiFi is first connected to the development board。

- (1) cd data/cfg

```
[root@px30_64:~]#
[root@px30_64:~]# ls
[root@px30_64:~]#
[root@px30_64:~]# cd ../../
[root@px30_64:/]# ls
bin      data    etc     lib     linuxrc  media  mnt    opt    rockchip_test  run
busybox.config  dev     init   lib64   lost+found  misc   oem    proc   root           sbin
[root@px30_64:/]#
[root@px30_64:/]# cd data/cfg
[root@px30_64:/userdata/cfg]#
[root@px30_64:/userdata/cfg]# vi wpa_supplicant.conf
[root@px30_64:/userdata/cfg]#
```

- (2) vi wpa_supplicant.conf

```
ctrl_interface=/var/run/wpa_supplicant
ap_scan=1

network={
    key_mgmt=NONE
}
~
~
~
~
~
~
~
```

input command : iwconfig to see the wlan info

```
[root@px30_64:~]# iwconfig
lo      no wireless extensions.

wlan0    IEEE 802.11  ESSID:"KFB-1000M"
          Mode:Master   Frequency:2.437 GHz   Access Point: 8A:25:93:C3:A2:E7
          Bit Rate=65 Mb/s   Tx-Power=32 dBm
          Retry min limit:7   RTS thr:off   Fragment thr:off
          Encryption key:off
          Power Managementmode:All packets received
          Link Quality=5/5   Signal level=-30 dBm   Noise level=-89 dBm
          Rx invalid nwid:0   Rx invalid crypt:0   Rx invalid frag:0
          Tx excessive retries:0   Invalid misc:0   Missed beacon:0

eth0     no wireless extensions.
```

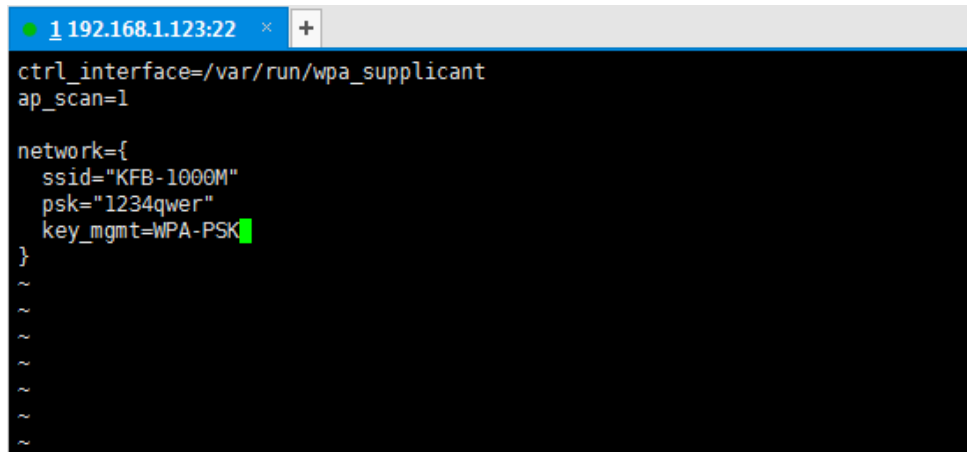
- (3) Configure WiFi numbers, passwords to connect to in the document.

wifi name:"KFB-xxx"

Password: "xxxx"

Key_mgmt=WPA-PSK

Users should configure according to the WiFi they want to connect to, for example:

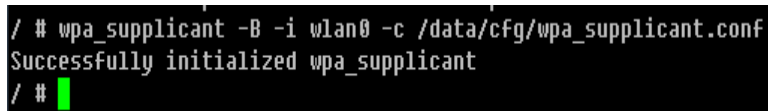


```
ctrl_interface=/var/run/wpa_supplicant
ap_scan=1

network={
    ssid="KFB-1000M"
    psk="1234qwer"
    key_mgmt=WPA-PSK
}
~
~
~
~
~
~
```

- (4) After confirmation, press Esc key and enter: wq to save and exit.

- (5) input: wpa_supplicant -B -i wlan0 -c /data/cfg/wpa_supplicant.conf



```
/ # wpa_supplicant -B -i wlan0 -c /data/cfg/wpa_supplicant.conf
Successfully initialized wpa_supplicant
/ #
```

- (6) input: iwconfig View WiFi connections:(Wifi has been successfully connected as shown in the following figure)

```
/ # wpa_supplicant -B -i wlan0 -c /data/cfg/wpa_supplicant.conf
Successfully initialized wpa_supplicant
/ # iwconfig
lo        no wireless extensions.

wlan0     IEEE 802.11  ESSID:"KFB-1000M"
          Mode:Master  Frequency:2.412 GHz  Access Point: 8A:25:93:C3:A2:E7
          Bit Rate=58.5 Mb/s   Tx-Power=32 dBm
          Retry min limit:7   RTS thr:off   Fragment thr:off
          Encryption key:off
          Power Management:off
          Link Quality=5/5  Signal level=-46 dBm  Noise level=-90 dBm
          Rx invalid nwid:0  Rx invalid crypt:0  Rx invalid frag:0
          Tx excessive retries:0  Invalid misc:0  Missed beacon:0
```

(7) input: # ./sbin/dhccpd/etc/dhccpd.conf

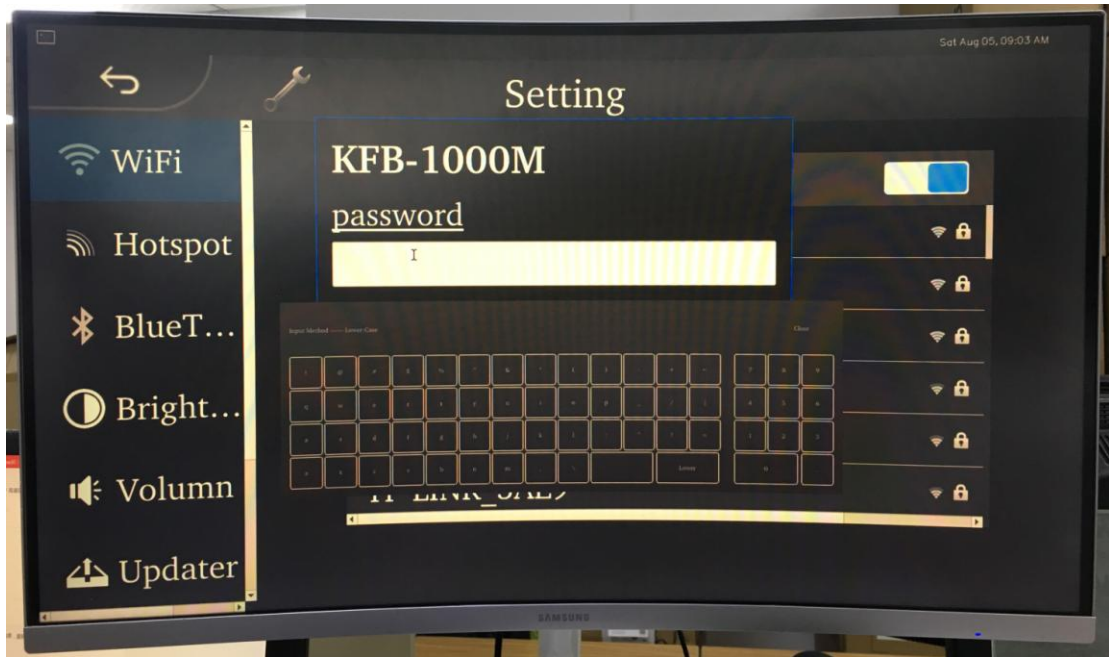
```
/ # ./sbin/dhccpd /etc/dhccpd.conf
sending commands to master dhccpd process
```

(8) input: ping www.baidu.com ,Test whether you can surf the Internet: (Success is shown in the following figure)

```
/ # ping www.baidu.com
PING www.a.shifen.com (119.75.217.26) 56(84) bytes of data.
64 bytes from 119.75.217.26 (119.75.217.26): icmp_seq=1 ttl=55 time=63.8 ms
64 bytes from 119.75.217.26 (119.75.217.26): icmp_seq=2 ttl=55 time=48.9 ms
64 bytes from 119.75.217.26 (119.75.217.26): icmp_seq=3 ttl=55 time=52.8 ms
64 bytes from 119.75.217.26 (119.75.217.26): icmp_seq=4 ttl=55 time=51.2 ms
64 bytes from 119.75.217.26 (119.75.217.26): icmp_seq=5 ttl=55 time=51.6 ms
```

(9) Use HDMI interface can show the wifi connect:





2.2 Ethernet Configuration

- (1) `ifconfig eth0 down`
- (2) `ifconfig eth0 192.168.1.123 up` // Here you specify the IP address of the machine
- (3) `vi /etc/resolv.conf` //change DNS : for example :192.168.1.1, then write : nameserver 192.168.1.1, save and quit.

```
[root@px30_64:/]#
[root@px30_64:/]# vi /etc/resolv.conf

# Generated by dhcpd from eth0.dhcp
# /etc/resolv.conf.head can replace this line
nameserver 192.168.1.1
# /etc/resolv.conf.tail can replace this line
~
~
~
```

DNS

(4) route -n // Check to see if the current gateway is correct. If not, you can modify it with the following commands.

(5) route add default gw 192.168.1.1 // 192.168.1.1

```
[root@px30_64:/]#
[root@px30_64:/]# route add default gw 192.168.1.1
[root@px30_64:/]#
[root@px30_64:/]# route -n
Kernel IP routing table
```

Destination	Gateway	Genmask	Flags	Metric	Ref	Use	Iface
0.0.0.0	192.168.1.1	0.0.0.0	UG	0	0	0	eth0
0.0.0.0	192.168.90.1	0.0.0.0	UG	202	0	0	eth0
169.254.0.0	0.0.0.0	255.255.0.0	U	303	0	0	wlan0
192.168.1.0	0.0.0.0	255.255.255.0	U	0	0	0	eth0
192.168.90.0	0.0.0.0	255.255.255.0	U	202	0	0	eth0

```
[root@px30_64:/]#
```

(6) ping test: ①ping 192.168.1.1

②ping www.microsoft.com

```
[root@px30_64:/]# ping 192.168.1.1
PING 192.168.1.1 (192.168.1.1) 56(84) bytes of data.
64 bytes from 192.168.1.1: icmp_seq=1 ttl=64 time=1.77 ms
64 bytes from 192.168.1.1: icmp_seq=2 ttl=64 time=0.876 ms
64 bytes from 192.168.1.1: icmp_seq=3 ttl=64 time=0.935 ms
64 bytes from 192.168.1.1: icmp_seq=4 ttl=64 time=0.818 ms
^C
--- 192.168.1.1 ping statistics ---
4 packets transmitted, 4 received, 0% packet loss, time 3005ms
rtt min/avg/max/mdev = 0.818/1.099/1.770/0.391 ms
[root@px30_64:/]#
[root@px30_64:/]# ping www.microsoft.com
PING e13678.ca.s.tl88.net (60.221.218.209) 56(84) bytes of data.
64 bytes from 209.218.221.60.adsl-pool.sx.cn (60.221.218.209): icmp_seq=1 ttl=50 time=49.2 ms
64 bytes from 209.218.221.60.adsl-pool.sx.cn (60.221.218.209): icmp_seq=3 ttl=50 time=48.0 ms
64 bytes from 209.218.221.60.adsl-pool.sx.cn (60.221.218.209): icmp_seq=4 ttl=50 time=48.3 ms
64 bytes from 209.218.221.60.adsl-pool.sx.cn (60.221.218.209): icmp_seq=5 ttl=50 time=49.4 ms
64 bytes from 209.218.221.60.adsl-pool.sx.cn (60.221.218.209): icmp_seq=6 ttl=50 time=48.5 ms
64 bytes from 209.218.221.60.adsl-pool.sx.cn (60.221.218.209): icmp_seq=7 ttl=50 time=48.8 ms
64 bytes from 209.218.221.60.adsl-pool.sx.cn (60.221.218.209): icmp_seq=8 ttl=50 time=48.1 ms
64 bytes from 209.218.221.60.adsl-pool.sx.cn (60.221.218.209): icmp_seq=9 ttl=50 time=48.2 ms
^C
```

2.3 Recording test

```
[root@px30_64:/]#  
[root@px30_64:/]# arecord -D hw:0,0 -c 10 -r 16000 -f S16_LE /data/test.wav -d 5  
Recording WAVE '/data/test.wav' : Signed 16 bit Little Endian, Rate 16000 Hz, Channels 10  
[ 696.857610] es7243_start:already init
```