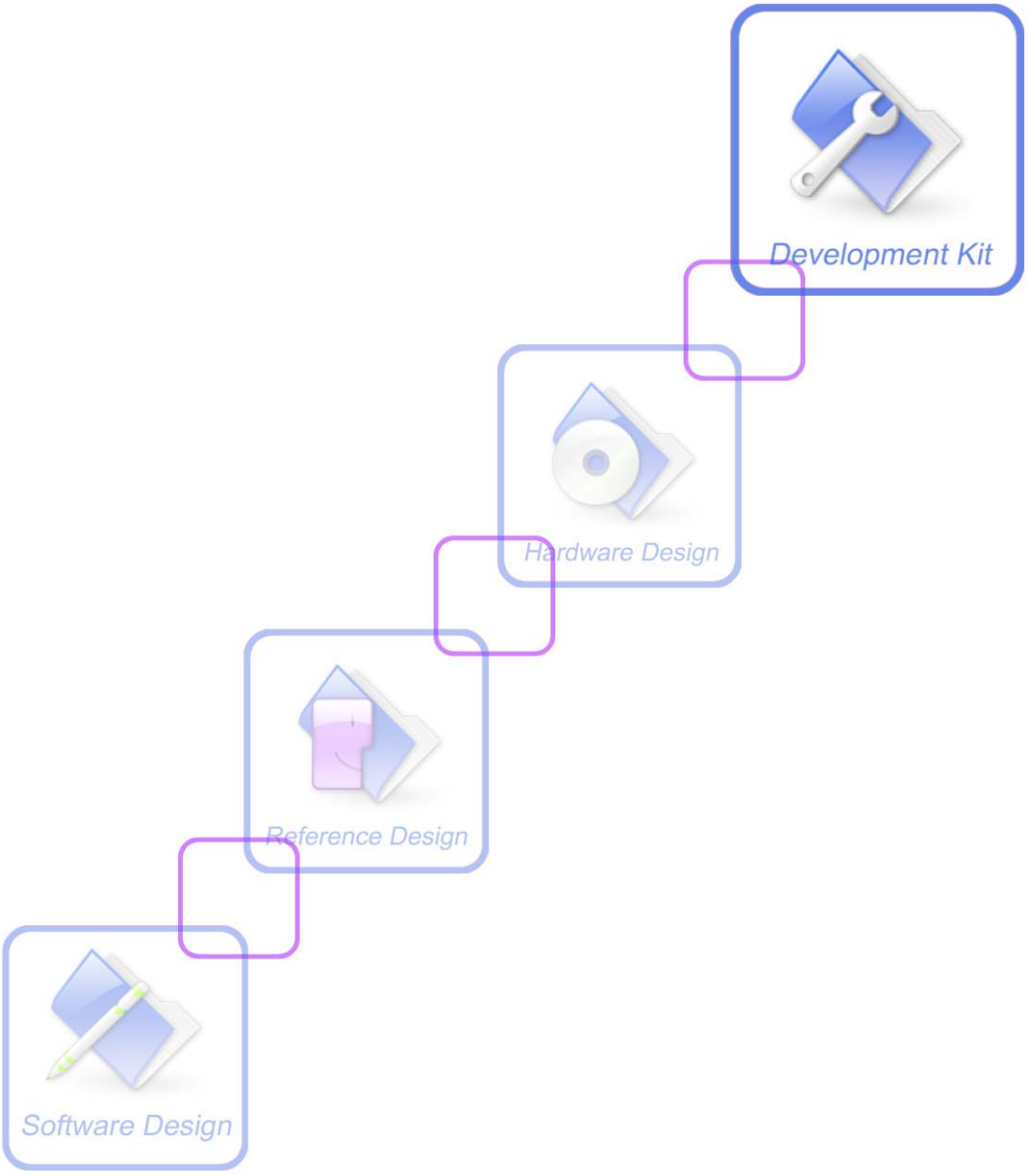
Mini PCIe_EVB kit_
User Guide_V1.00



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Version History

Data	Version	Description of change	Author
2014-05-05	1.00	Origin	Honggang Ma

SCOPE

This document describes how to use Mini PCIe EVB to do test; user can get useful information about the Mini PCIe EVB quickly through this document. This document applies to Mini PCIe products from SIMCom Company.

This document is subject to change without notice at any time.

1. Mini PCIe EVB

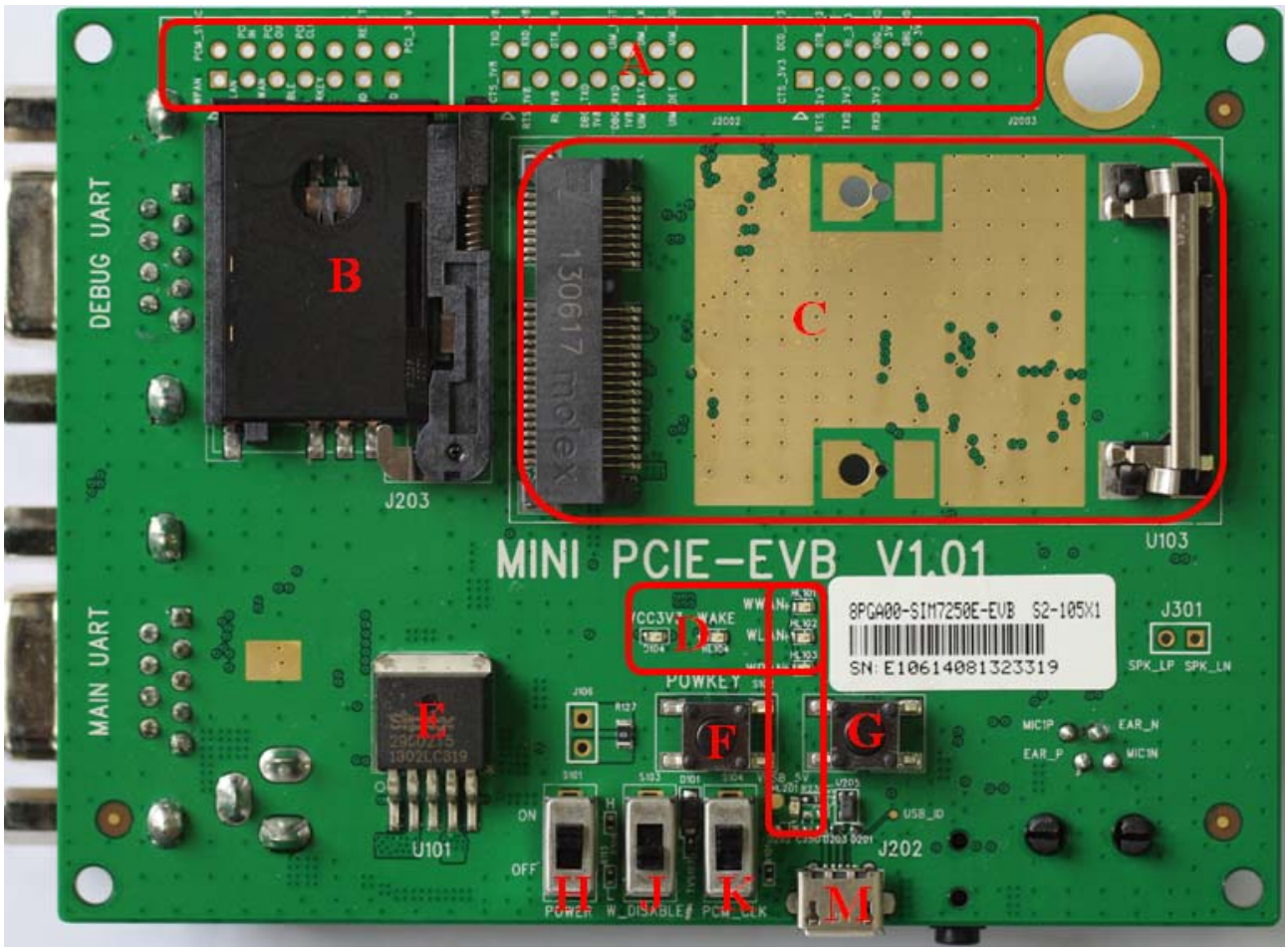

Figure 1: EVB top view

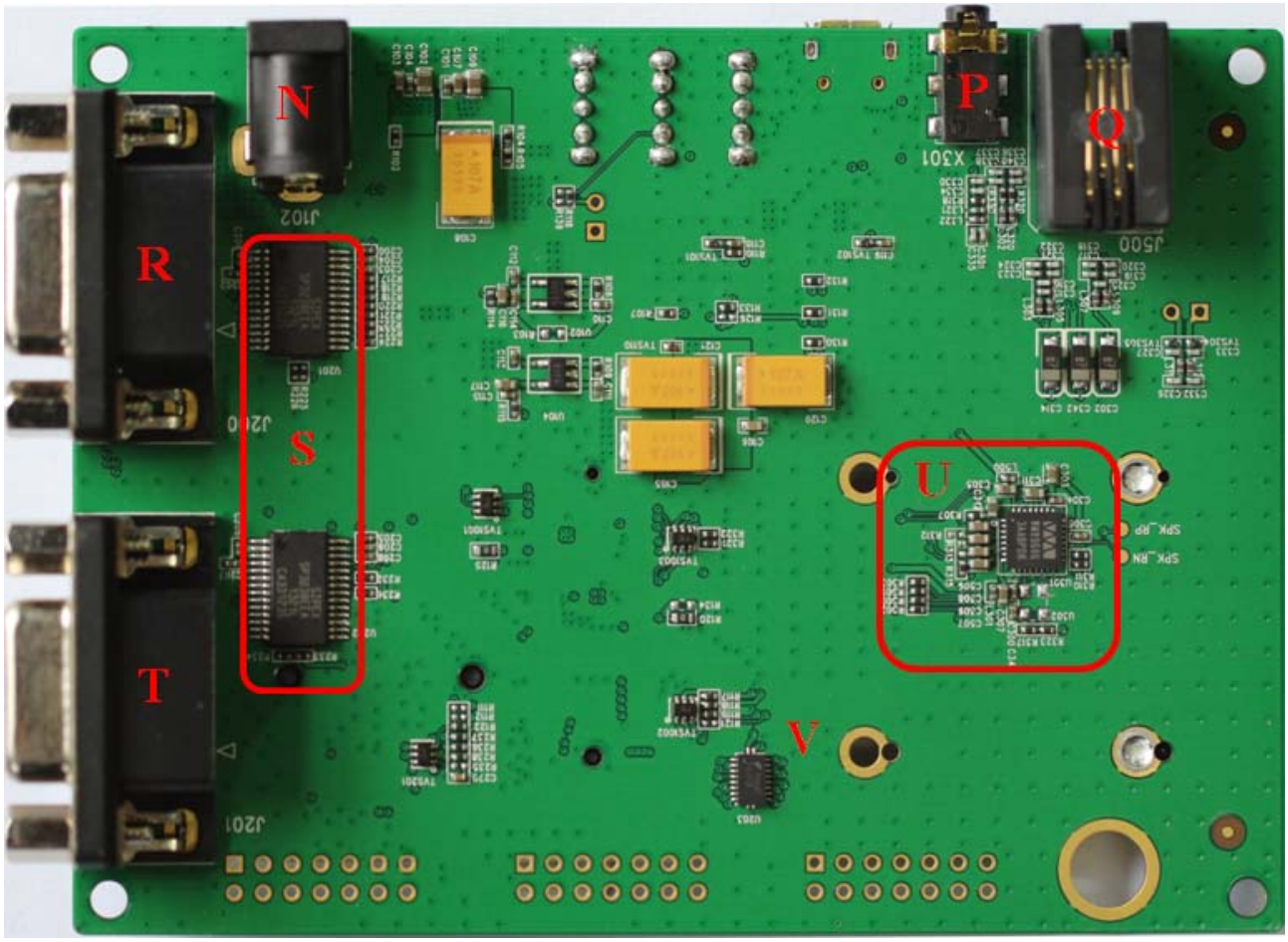

Figure 2: EVB bottom view

A: Test point
B: SIM card socket with SIM_DET function
C: Mini PCIe card holder
D: Indicator LED
E: System power (3.3V)
F: Power on key (reserved)
G: System reset key
H: Power switch
J: RF control switch
K: WM8960 clock enable signal (reserved)
M: Micro USB connector
N: 5V DC jack
P: Audio jack (reserved)
Q: Handset jack
R: Main UART (reserved)
S: UART to RS232 IC
T: DBG UART (reserved)
U: WM8960 codec
V: Level shifter

2. EVB Accessory

Figure 3: EVB accessory

A: GSM/WCDMA/LTE Antenna
B: 5V DC adapter
C: Antenna cable
D: Mini PCIe EVB
E: Micro USB cable
F: GPS/GLONASS Antenna

3. Accessory Interface

3.1 Adapter Interface

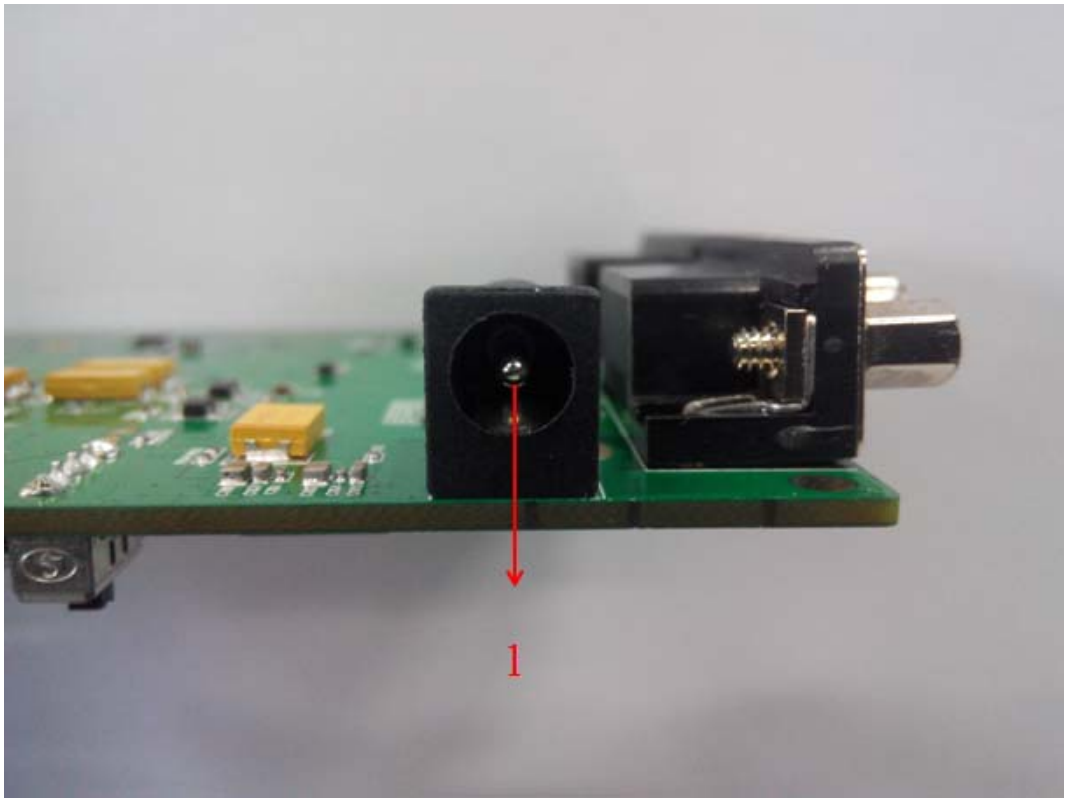

Figure 4: Adapter interface

Table 1: 5V adapter interface

Pin	Signal	I/O	Description
1	Adapter input	I	5V/2.0A DC source input

3.2 Audio Interface

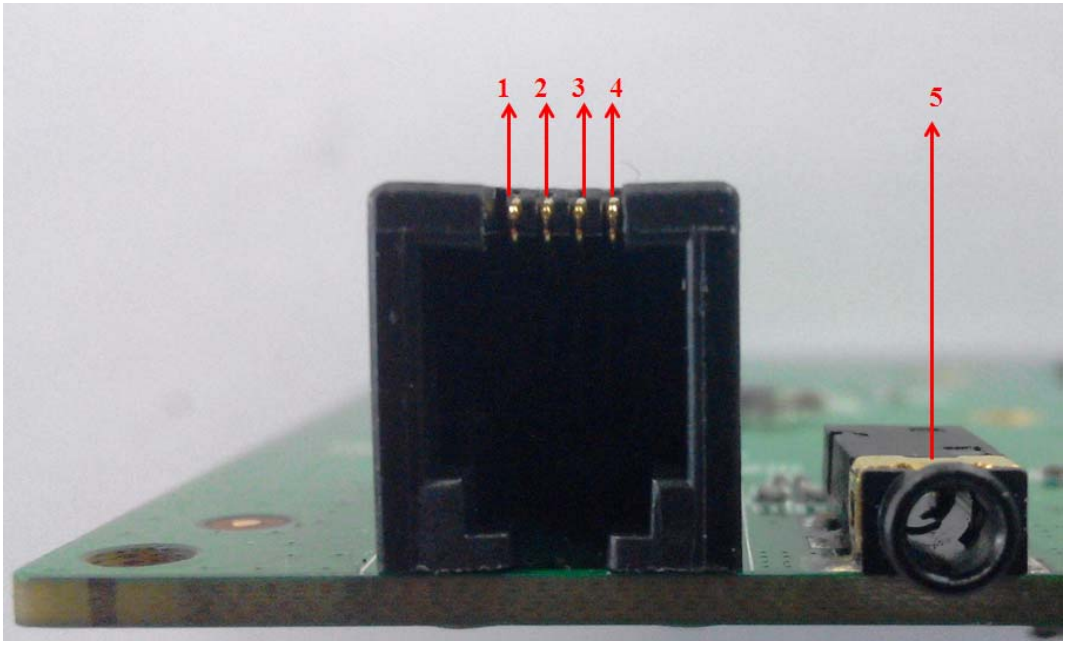

Figure 5: Audio interface

Table 2: Headset interface

Pin	Signal	I/O	Description
1	MIC1N	I	Negative microphone input
2	EAR1N	O	Negative receiver output
3	EAR1P	O	Positive microphone input
4	MIC1P	I	Positive receiver output

Table 3: Earphone interface:

Pin	Signal	I/O	Description
5	MIC2& Headphone	I/O	Auxiliary audio input/output

Note: The default audio channel is headset interface (MIC1 and EAR1), customer should connect the headset to the headset interface, and the sequence of the signal should match with table 2.

3.3 SIM card interface

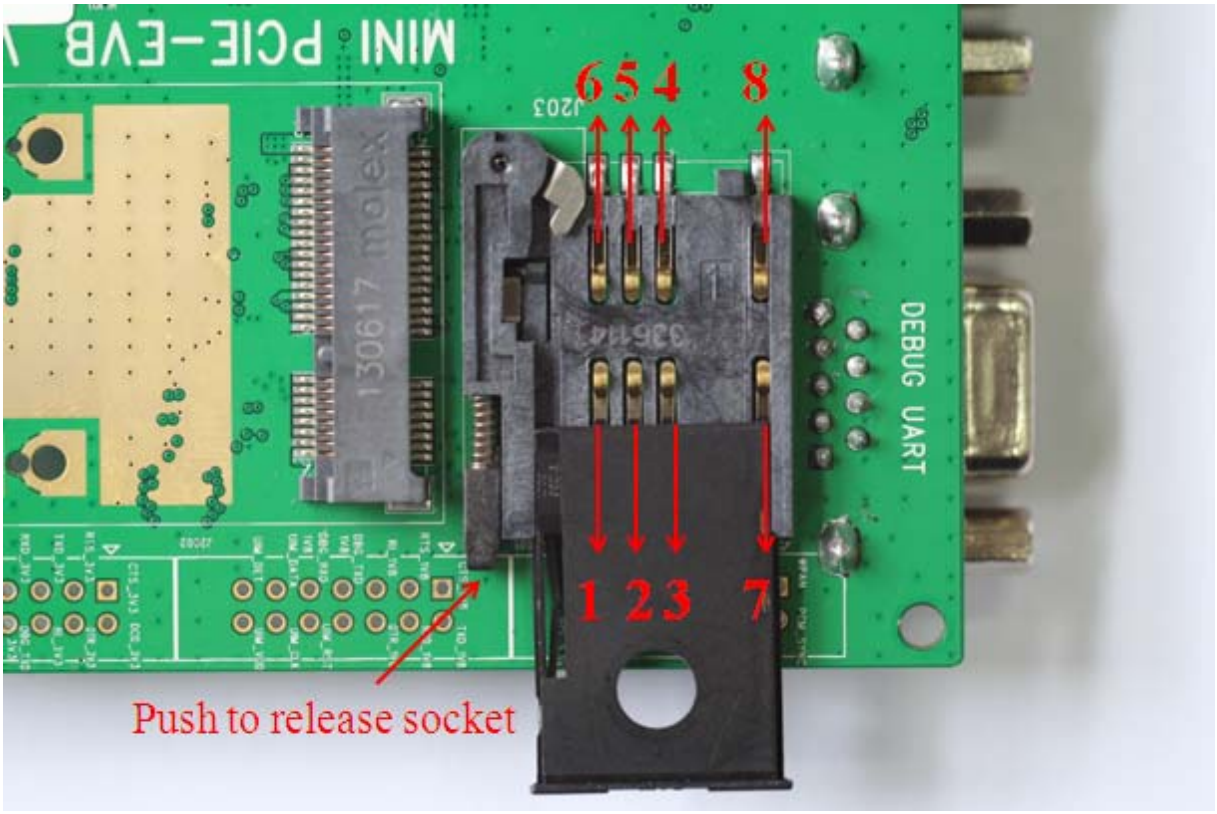

Figure 6: SIM card interface

Table 4: UIM card socket

Pin	Signal	I/O	Description
1	GND	-	Ground
2	UIM_VPP	-	NC
3	UIM_DATA	I/O	External UIM card data signal
4	UIM_CLK	O	External UIM card clock signal
5	UIM_RST	O	External UIM card reset signal
6	UIM_VDD	O	Power source for the external UIM card
7	GND	-	Ground
8	UIM_DET	I	External UIM card presence detect signal, hot swap

3.4 Antenna Interface

Figure 7: Antenna interface

Note: This chapter takes SIM7250E as an example, the sequence of antennas maybe different, customer should refer to the relevant Hardware Design document.

3.5 UART port interface

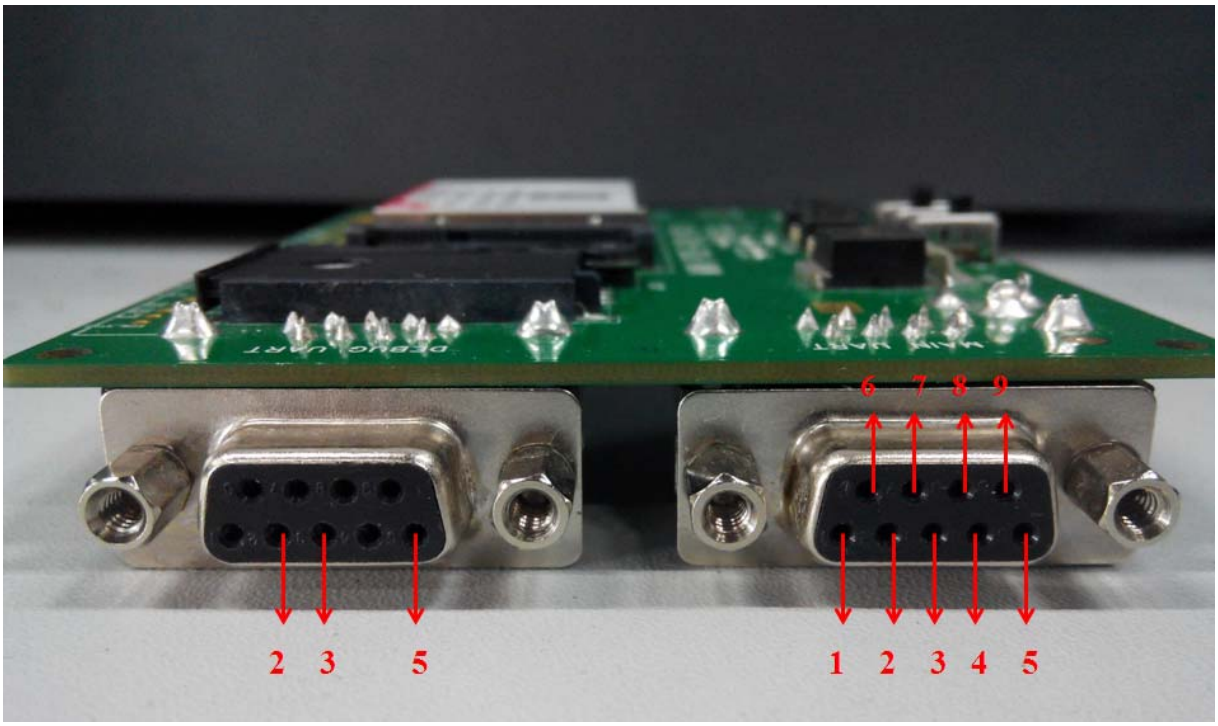

Figure 8: UART ports

Main UART (Reserved)
AUX UART (Reserved)

Table 5: Main UART port

Pin	Signal	I/O	Description
1	DCD	O	Data carrier detection
2	TXD	O	Transmit data
3	RXD	I	Receive data
4	DTR	I	Data Terminal Ready
5	GND		GND
6	-	-	-
7	CTS	I	Clear to Send
8	RTS	O	Request to Send
9	RI	O	Ring Indicator

Table 6: Debug UART Port:

Pin	Signal	I/O	Description
2	DEBUG_TX	O	Transmit data
3	DEBUG_RX	I	Receive data
5	GND		GND

3.6 LED Indicator and Switch

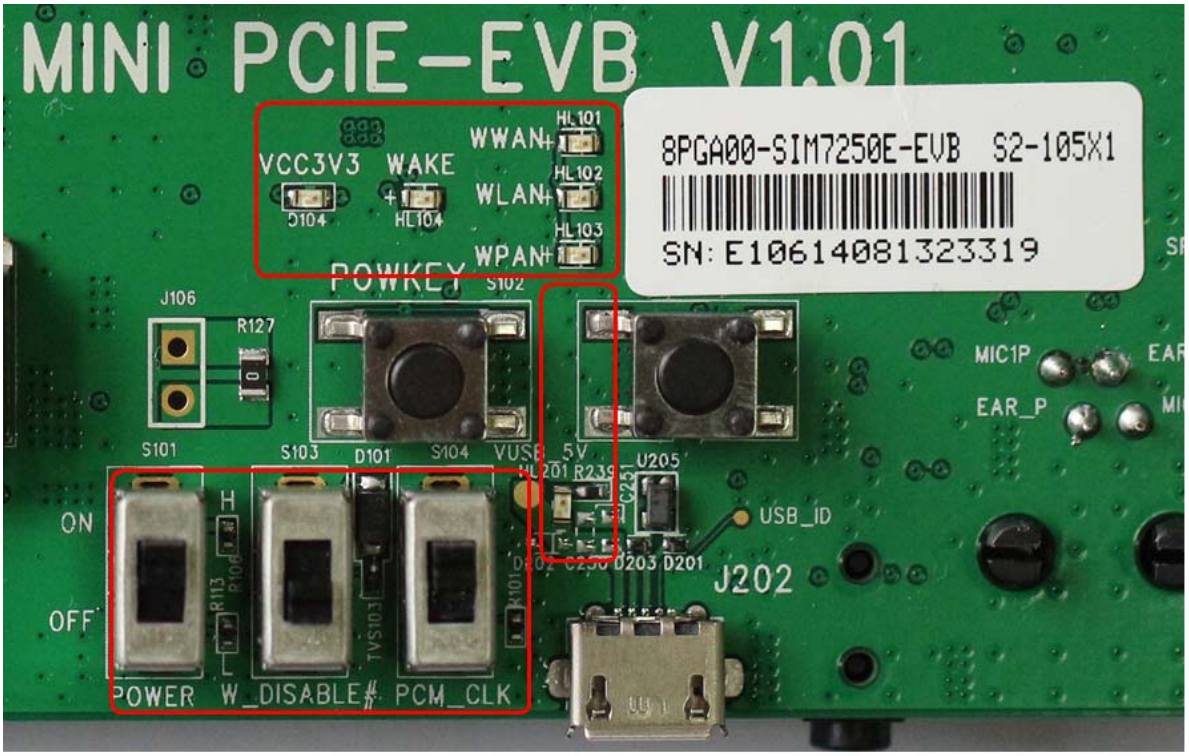

Figure 9: LED indicator and Switch

Figure 9 shows the indicator LED and function switch, the detail function please refer to table 7 and table 8.

Table 7: Working state of LED as list:

Ref No.	Name	Function description
D104	VCC3V3 indicator	Bright：system has the 3.3V power Extinct: system does not have the 3.3V power
HL104	WAKE indicator	Blinking one time when module wake up host
HL101	WWAN indicator	Refer to the HD document for details;

HL102	WLAN indicator	Reserved for WLAN function
HL103	WPAN indicator	Reserved for WPAN function
HL201	USB indicator	Bright：USB cable inserted Extinct: USB cable does not insert

Table 8: Function of switch

Ref No.	Name	Function description
S101	VCC3V3 indicator	Bright：system has the 3.3V power Extinct: system does not have the 3.3V power
S103	RF Control switch	Switch down: module goes into airplane mode Switch up: module controlled by software
S104	PCM Clock enable switch	Reserved, switch at middle state

4. Test Interface

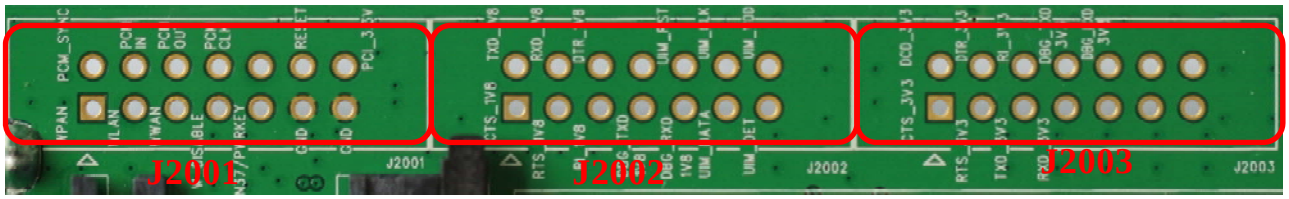

Figure 10: Test interface overview

4.1 J2001

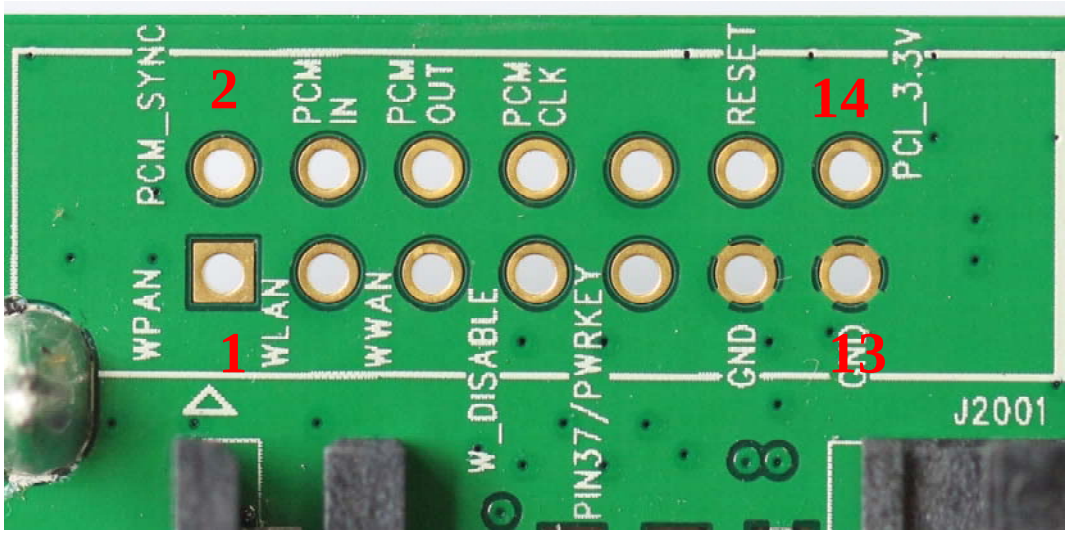

Figure 11: J2001 interface

Table 9: J103 Interface Pin List

Pin	Signal	I/O	Description
1	WPAN	I	Reserved for WPAN
2	PCM_SYNC	O	PCM frame synchronization
3	WLAN	I	Reserved for WLAN
4	PCM_IN	I	PCM data input
5	WWAN	I	Network status indicator
6	PCM_OUT	O	PCM data output
7	W_DISABLE	I	Active low signal for wireless disabling (Airplane mode)
8	PCM_CLK	O	PCM clock
9	PIN37/PWRKEY	-	Reserved
10	NC	-	-

11	GND	-	Ground
12	RESET	I	Active low functional reset to the card
13	GND	-	Ground
14	PCI_3.3V	I	3.3V supply

4.2 J2002

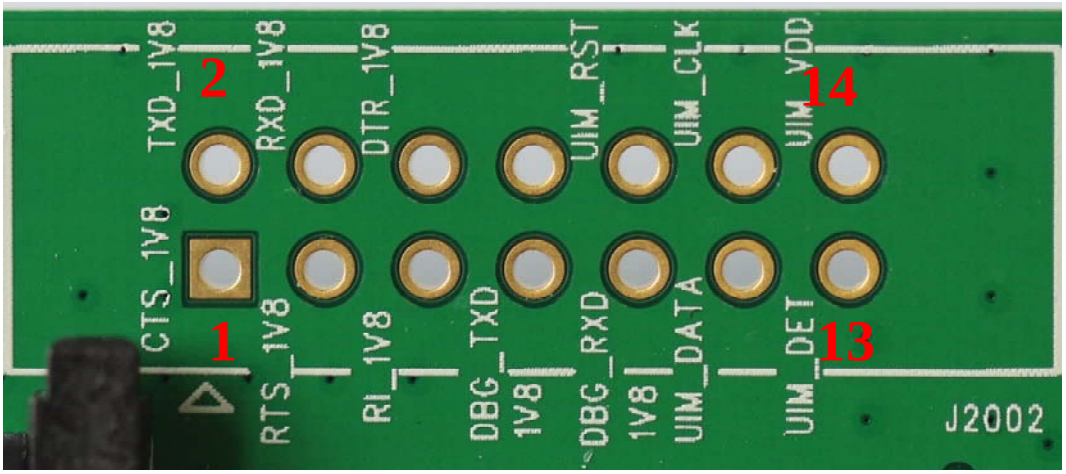

Figure 12: J2002 interface

Table 10: J2002 Interface Pin List

Pin	Signal	I/O	Description
1	CTS_1V8	I	Reserved for future use. (1.8V voltage domain)
2	TXD_1V8	O	
3	RTS_1V8	O	
4	RXD_1V8	I	
5	RI_1V8	O	
6	DTR_1V8	I	
8	DCD_1V8	O	
7	DBG_TXD_1V8	O	Reserved for DEBUG (1.8V voltage domain)
9	DBG_RXD_1V8	I	
10	UIM_RST	O	UIM card reset signal
11	UIM_DATA	I/O	UIM card data signal
12	UIM_CLK	O	UIM card clock signal
13	UIM_DET	I	External UIM card presence detect signal, hot swap
14	UIM_VDD	O	Power source for the external UIM card

4.3 J2003

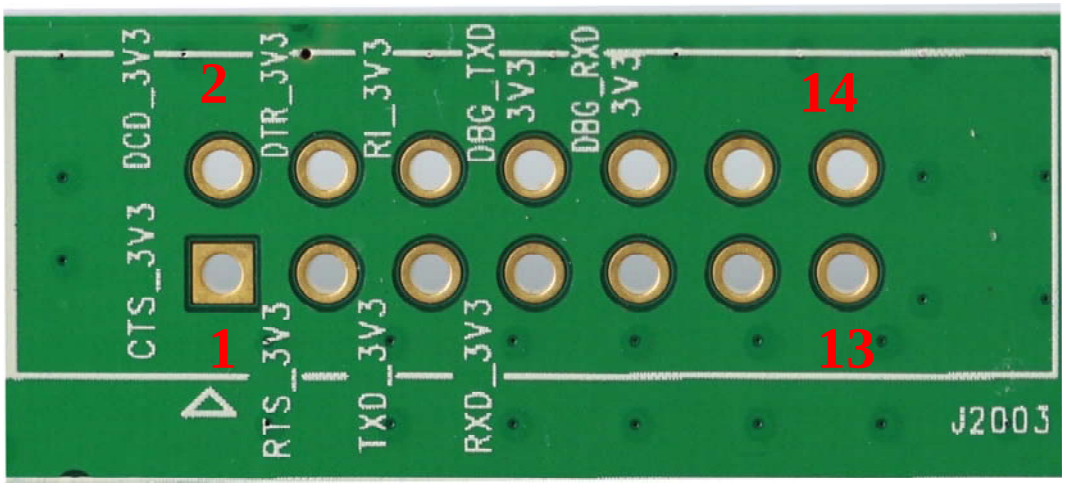

Figure 13: J2003 interface

Table 11: J2003 Interface Pin List

Pin	Signal	I/O	Description
1	CTS_3V3	O	The UART port is a full function serial port, reserved for debug and future use. (3.3V voltage domain) The DBG port is a 3-wire serial port, reserved for debug and future use. (3.3V voltage domain)
2	DCD_3V3	I	
3	RTS_3V3	I	
4	DTR_3V3	O	
5	TXD_3V3	I	
6	RI_3V3	I	
7	RXD_3V3	O	
8	DBG_TXD_3V3	I	
9	-	-	
10	DBG_RXD_3V3	O	
11	NC		
12	NC		
13	NC		
14	NC		

5. EVB and Accessory

The EVB and its accessory are equipped as the Figure 14

Figure 14: EVB and accessory

Note: the headset is not included in the EVB Kit. S101 and S103 switch up and set the S104 at the middle position.

6. Illustration:

6.1 Power on module

The Mini PCIe module is designed with auto power on with power appears.

The procedure of power on the module described as the following steps:

1. Insert the module to the Mini PCIe EVB;
2. Equip the accessory as figure 14 shows; make sure the SIM card has equipped;
2. Plug in 5V DC adapter, and switch S101 to "**ON"** state, then D104 will lighten;

The module would power on, HL101 would flash at a certain frequency, and user can judge registering status of the module by the HL101. For detailed description, please refer to *document [1]*.

6.2 Registering Network and making a call

User should setup the driver on the PC for the proper operation, The procedure of making a call described as the following steps:

1) User should power on the module as chapter 6.1 described.
2) Connect the micro USB cable to the USB connector;
3) Open the Hyper Terminal (AT command windows) on your computer.
4) Check the serial port number: My computer (right click) →Manage → Device Manager → Ports (COM&LPT)

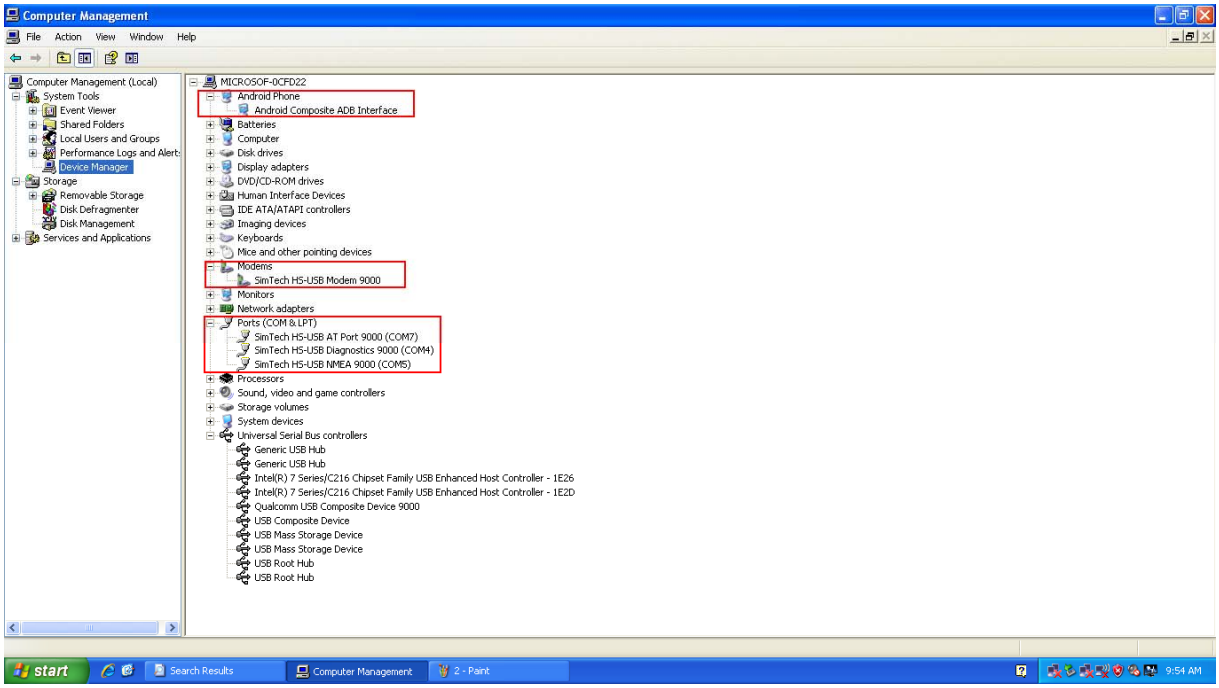

Figure 15: COM ports and modem

5) Use the Hyper Terminal to call the module as following steps:

- Open the HyperTerminal: START→ All Programs → Accessory →Communication → HyperTerminal.

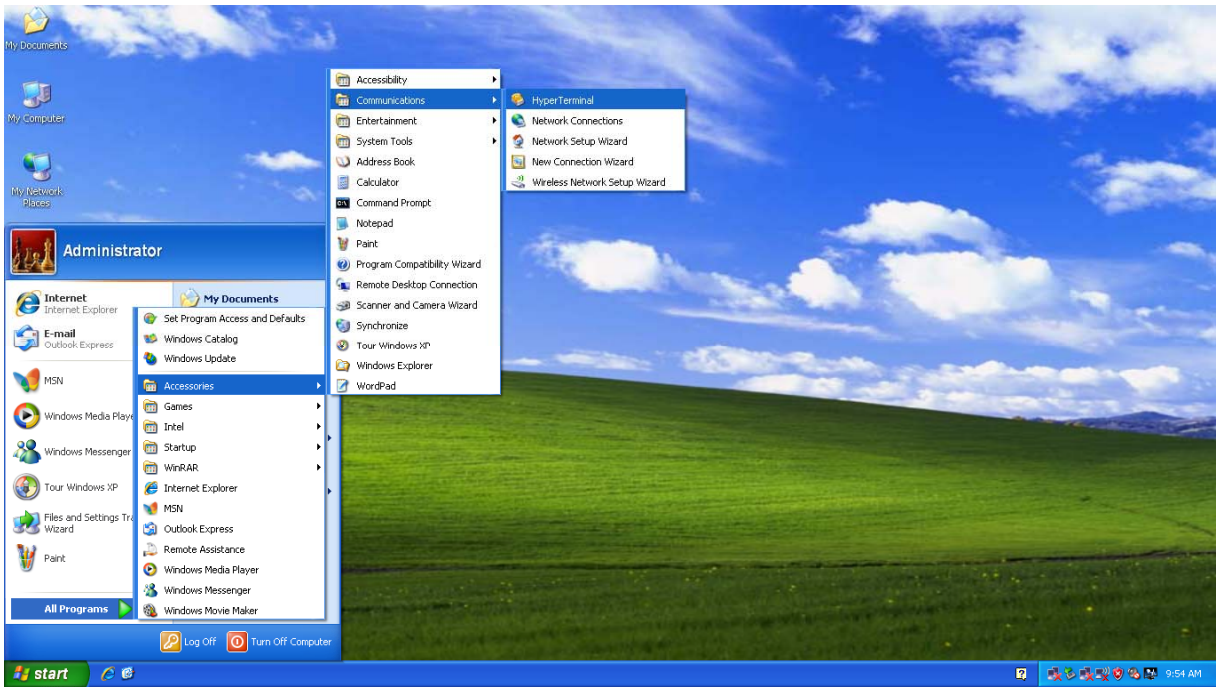

Figure 16: Run the hyper terminal

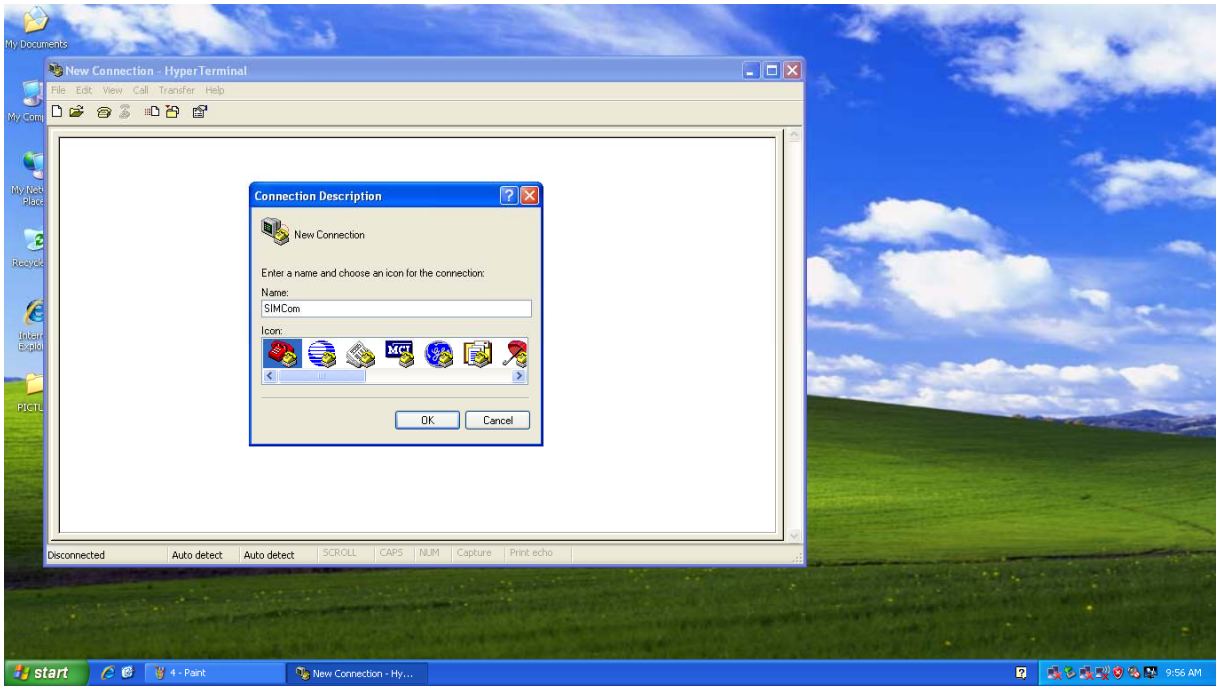

Figure 17: Name the hyper terminal

- Configure the serial port number

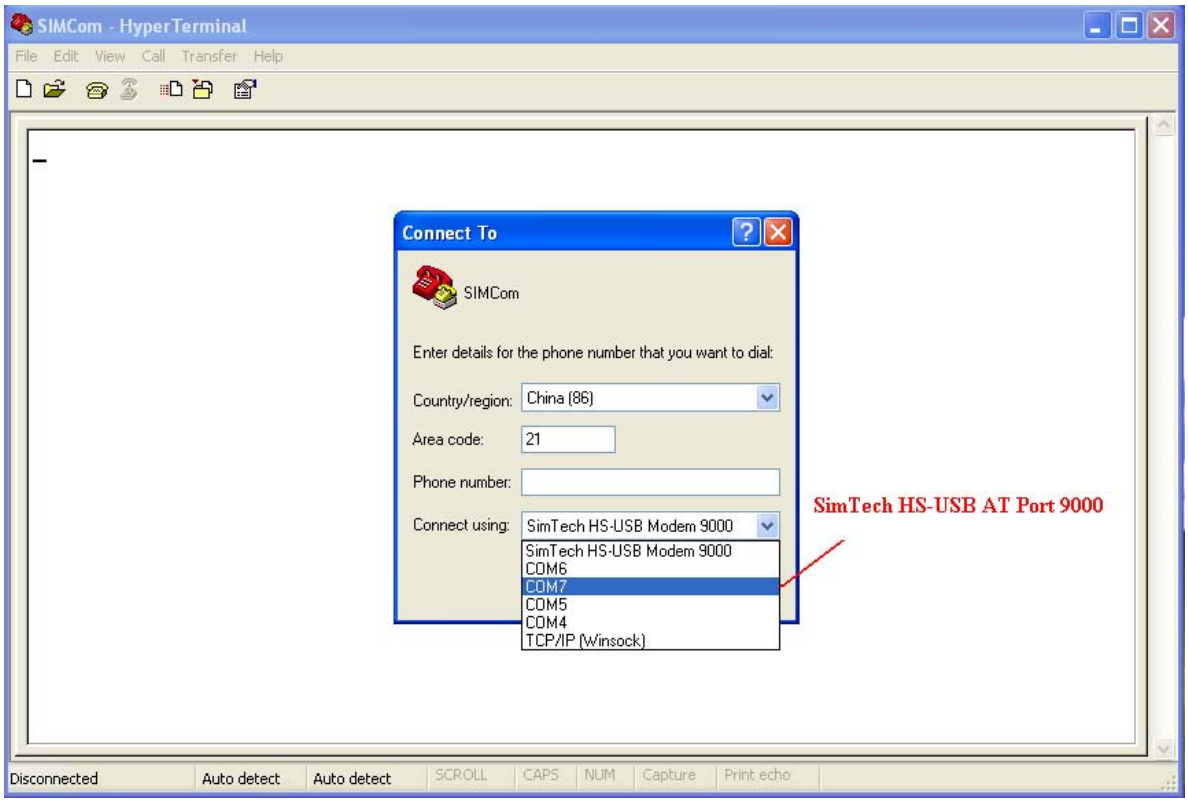

Figure 18: Choose the right COM port

- Set the baud rate and flow control, User can set the baud rate from 1200bps to 115200bps, and the flow control set to "None"

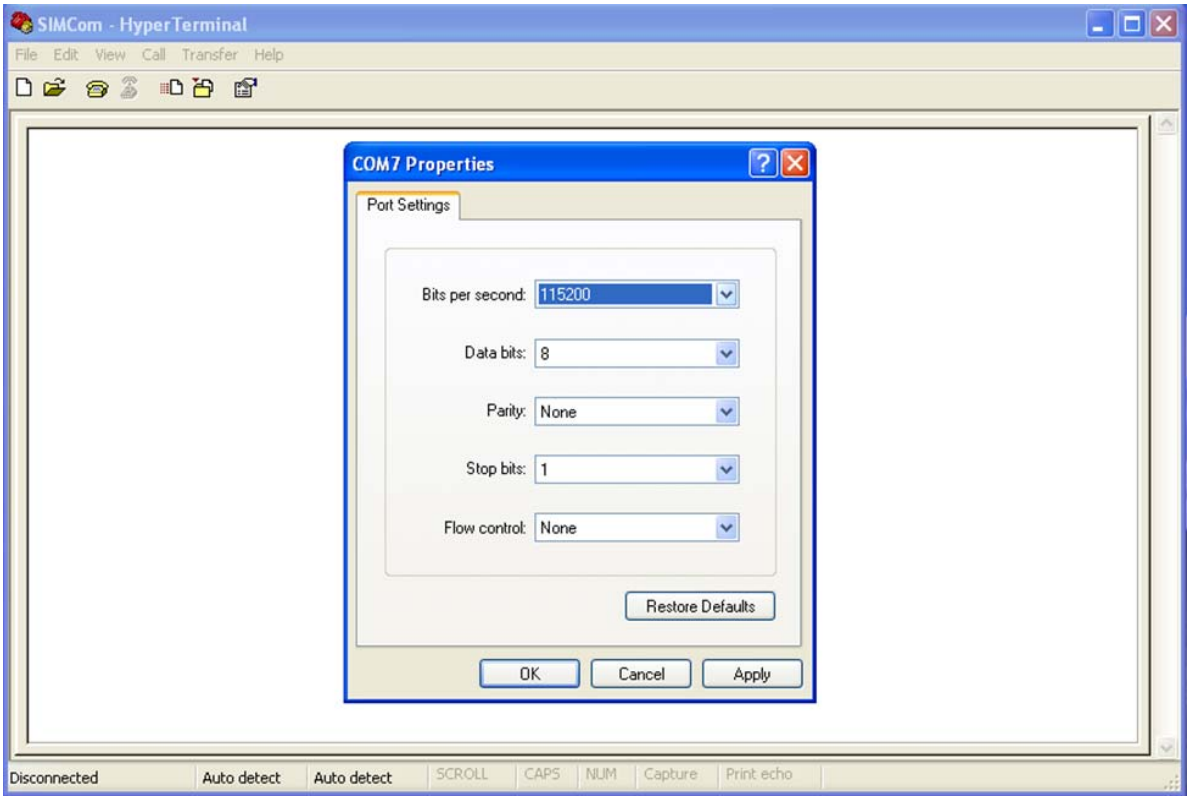

Figure 19: Set up the COM property

- Connect the module

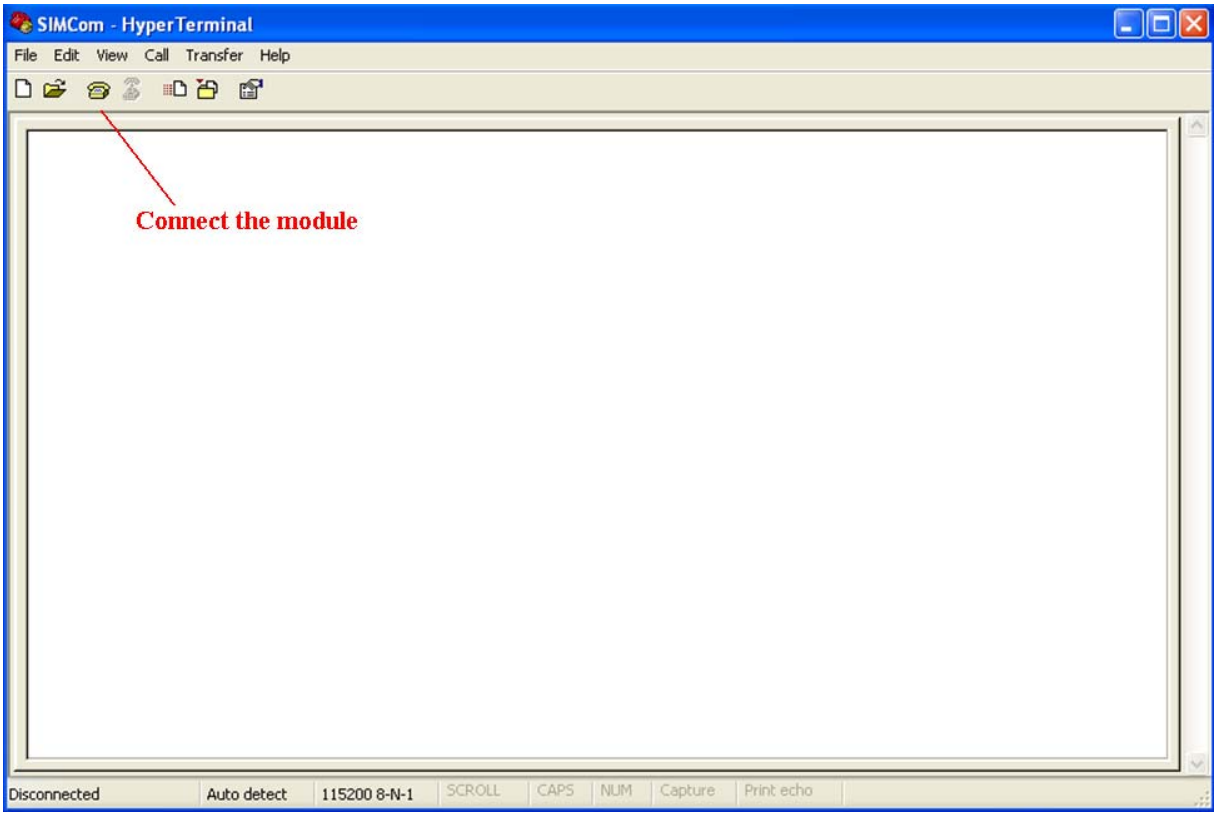

Figure 20: Connect the module

6) Click the “call” icon.
   - Typing the AT command. When module is powered on, user must firstly send “AT” to synchronize the baud rate. The default setting of the module is autobauding.
   - Use AT command ATD to make a call.

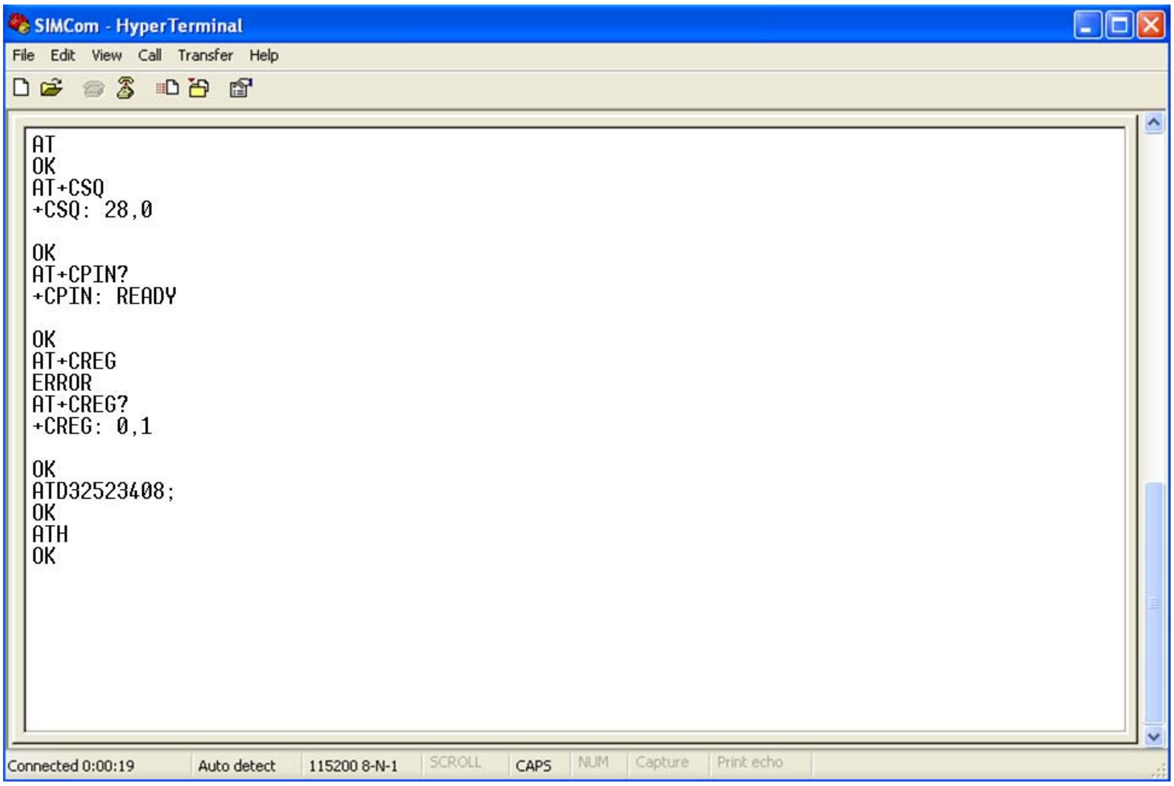

Figure 21: Make a call

7) User can also operate the GPS with the AT+CGPS command, then user can see the NMEA information from the SimTech HS-USB NMEA Port. Refer to the AT Command document to get more operation guide.

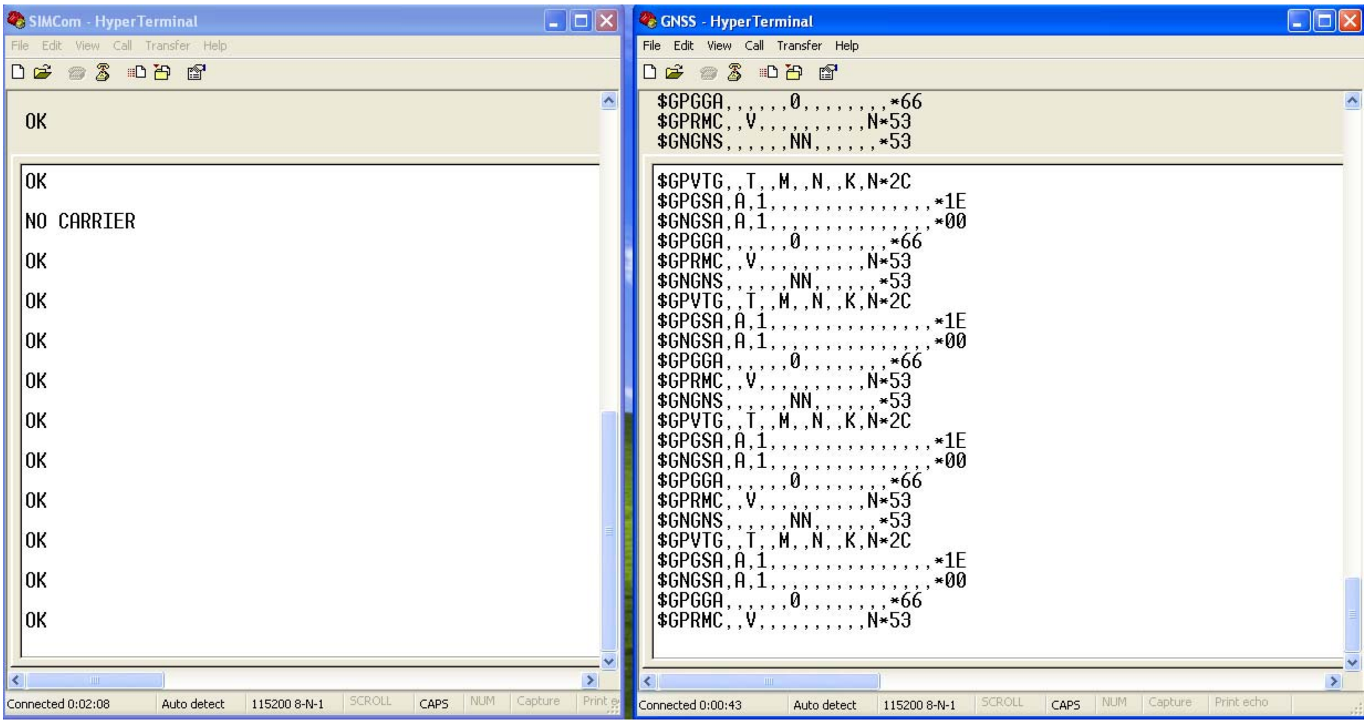

Figure 22: Open GNSS

6.3 Downloading

This chapter introduces software upgrade process of SIM72X0 series modules. The update tool is "SIM72X0_UpdateTool_V1.0.exe". The following pictures show the upgrade process and other functional processes.

6.3.1 USB Port Specification

First user should connect the micro USB cable to module, and power on the module.

Then user could run the tool, after the tool is opened, it will scan the device, if the module is ready, the tool will display like the following picture.

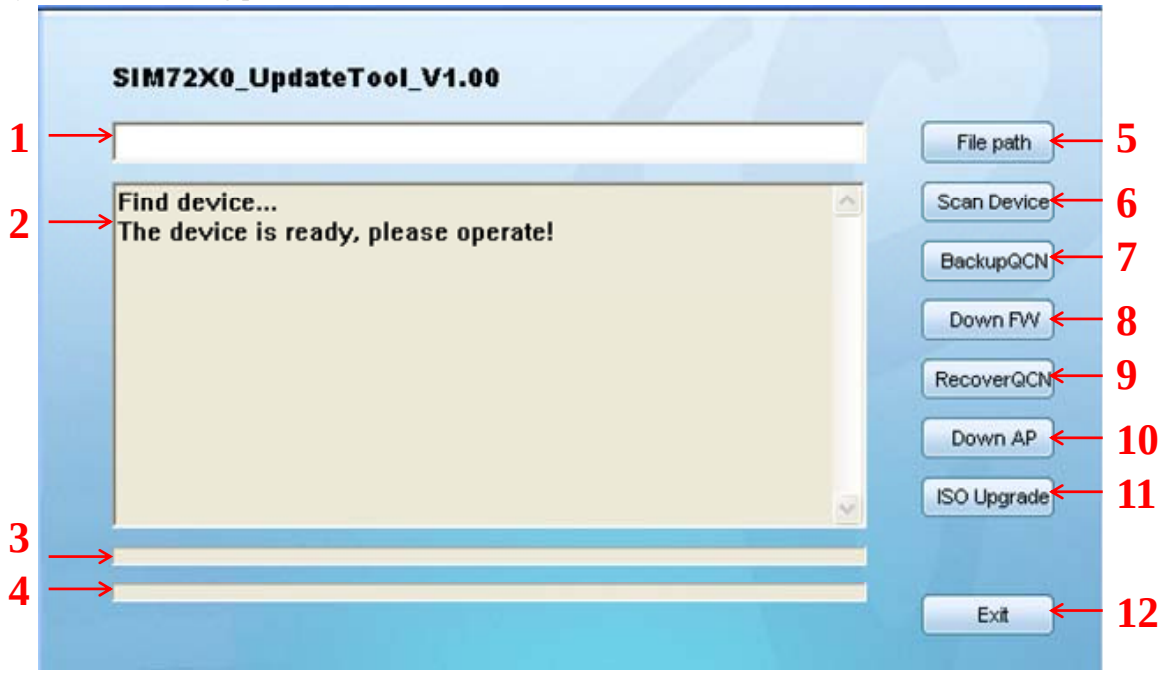

Figure 23: Run the download tool

1: The upgrade files display area.
2: The upgrade process display area.
3: The progress bar shows the step function.
4: The progress bar shows the total function.
5: File selection button.
6: Device scan button.
7: QCN file backup button.
8: Firmware download button.
9: QCN file recover button.
10: Image files download button.
11: ISO file upgrade button.
12: Exit the program.

6.3.2 Firmware Update

First user should connect the micro USB cable to module, and power on the module. Then user could run the tool, Tool will scan the device automatically, if the module is ready, the tool will prompts the user to upgrade.

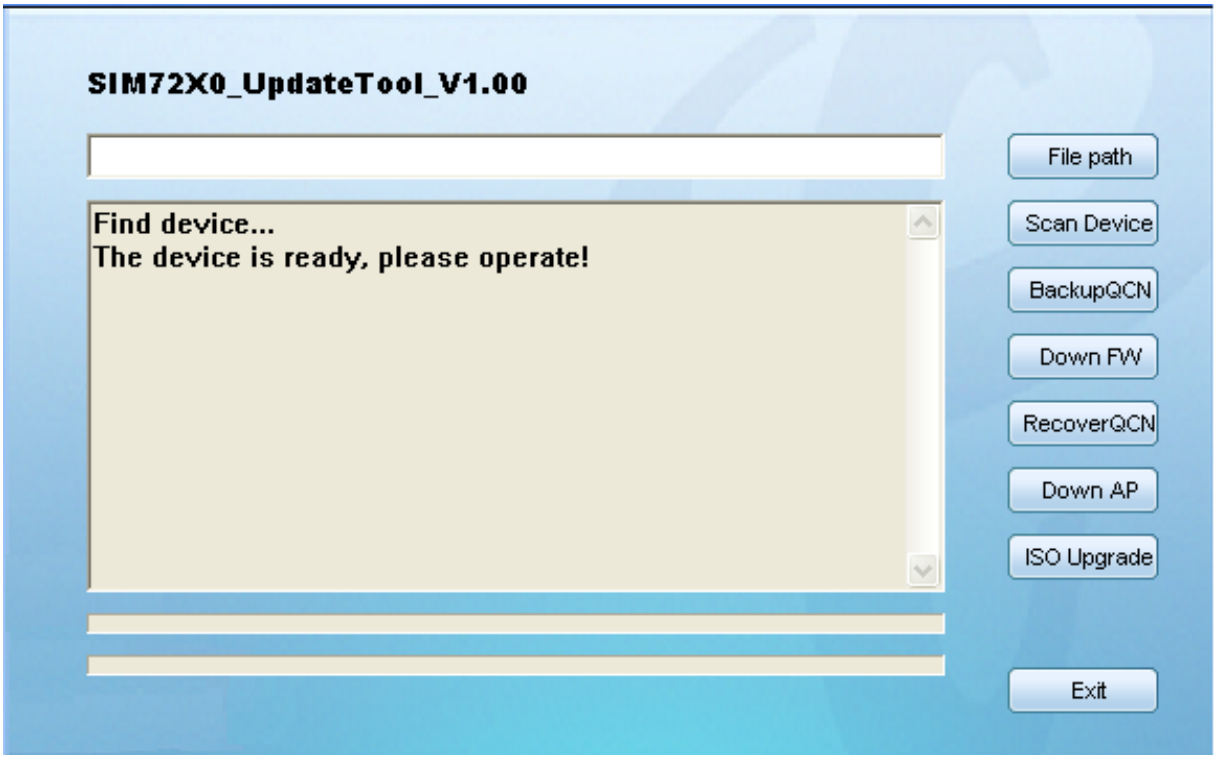

Figure 24: Browse the software package

[File path]

Upgrade FW or upgrade the AP file, user need to select the upgrade file path firstly.

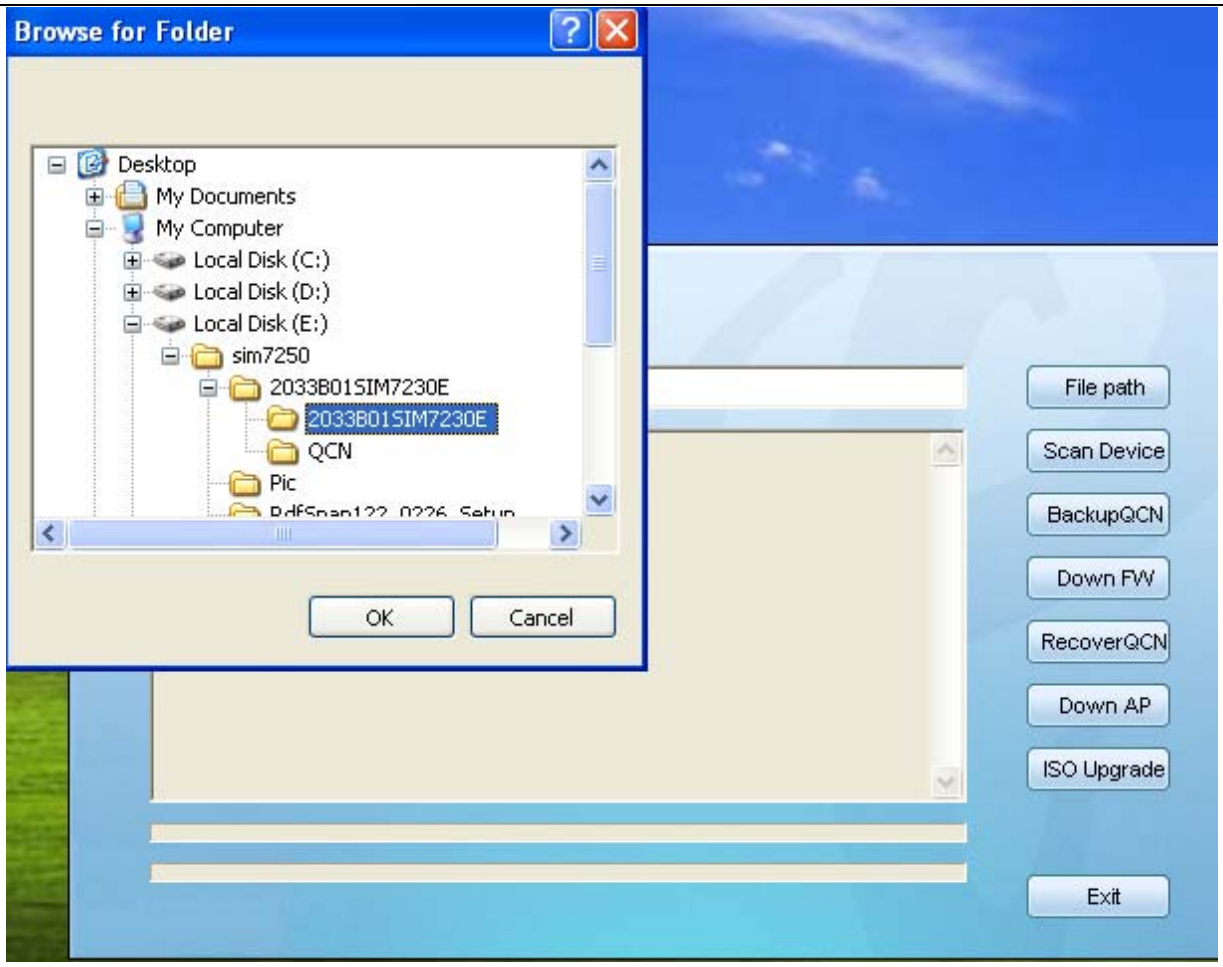

Figure 25: Start download

[Scan Device]

Click the [Scan Device] button, The tool will re enumeration and connection device, to determine whether the device is in the ready state

.

[BackupQCN]

Before upgrading the FW file, may require to backup the QCN data in the module.

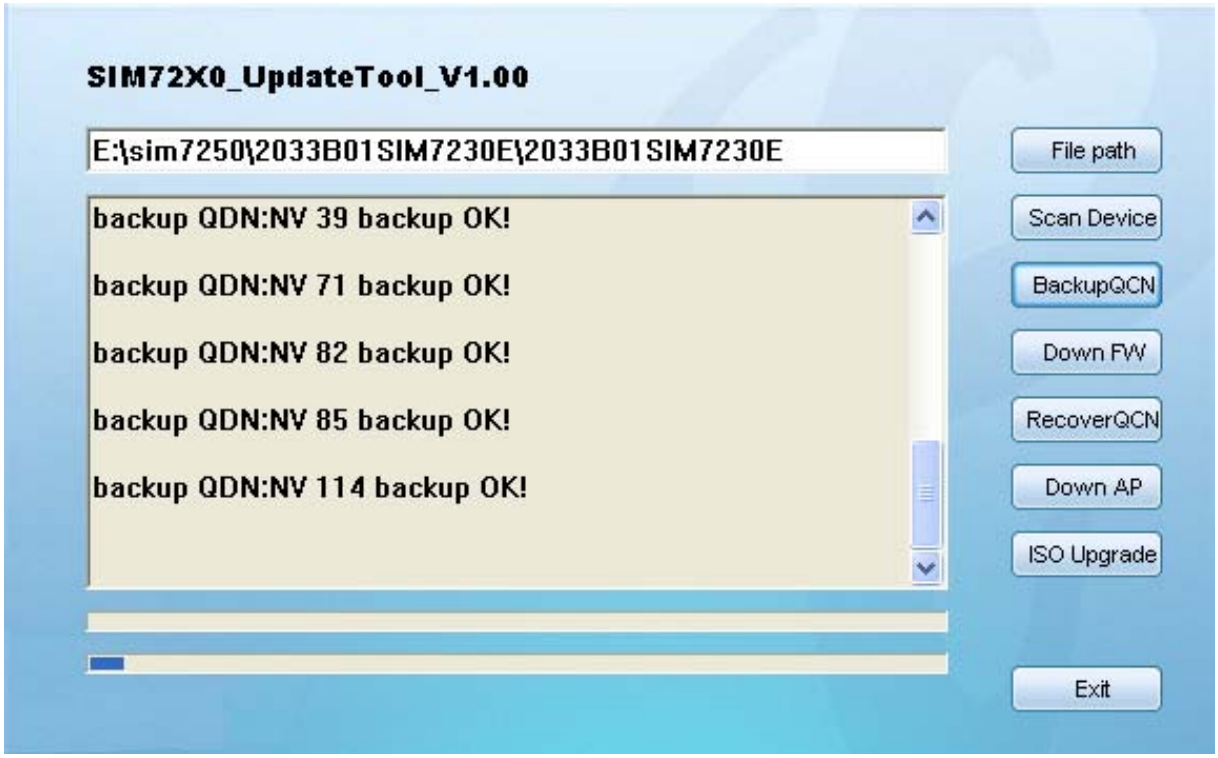

Figure 26: Backup QCN

Backup finished

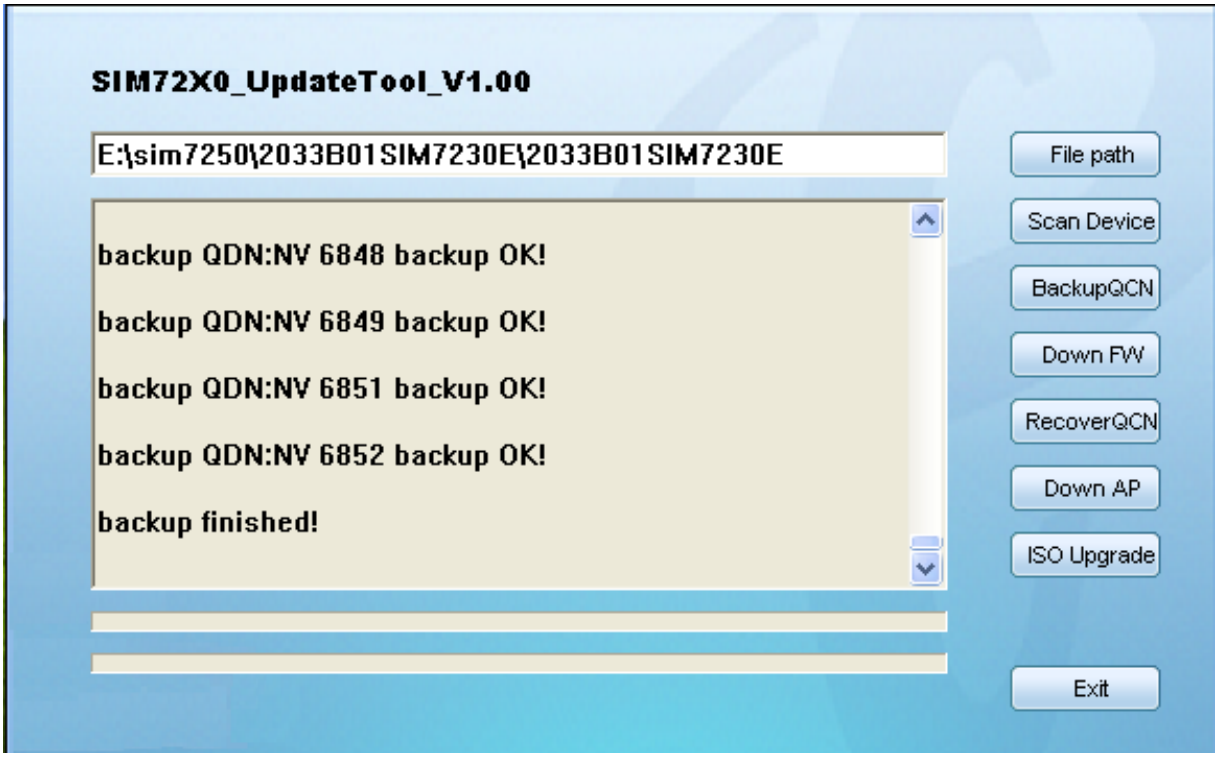

Figure 27: Backup finished

[Down FW]

Click [Down FW] button to upgrade firmware, this process may take several minutes to complete. In the process of upgrading, do not close the PC tool, or unplug the device.

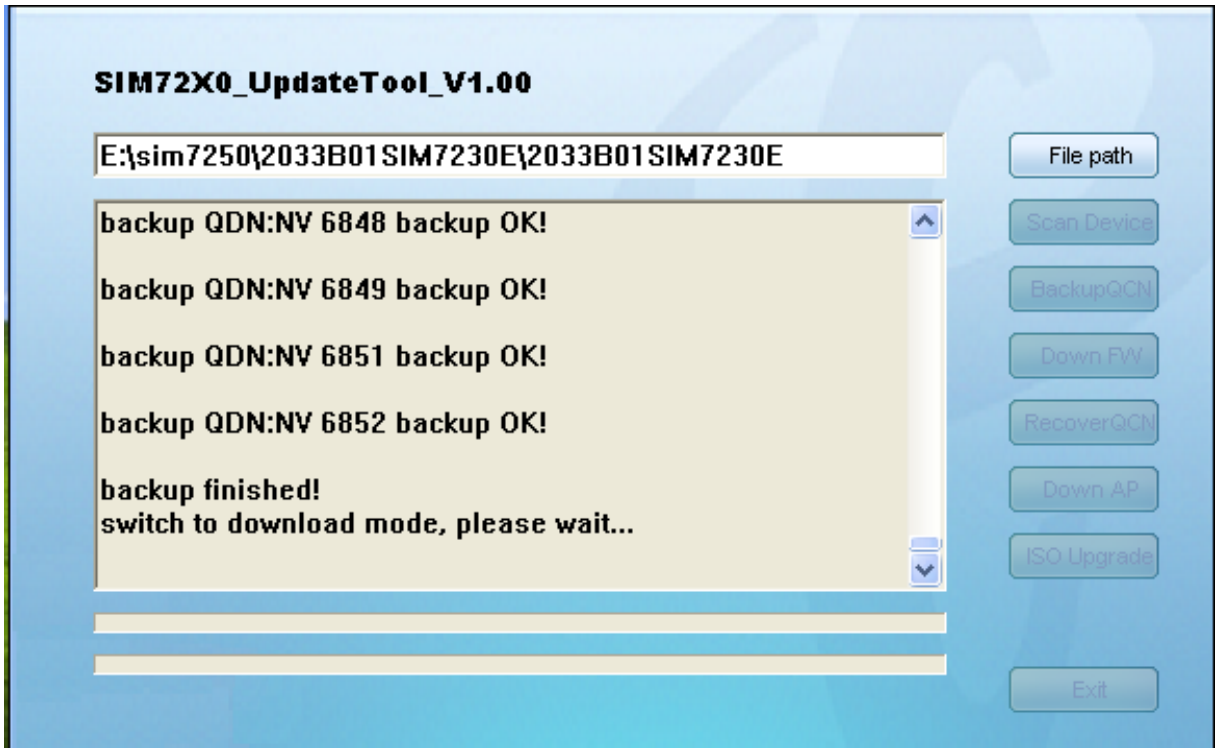

Figure 28: Down FW

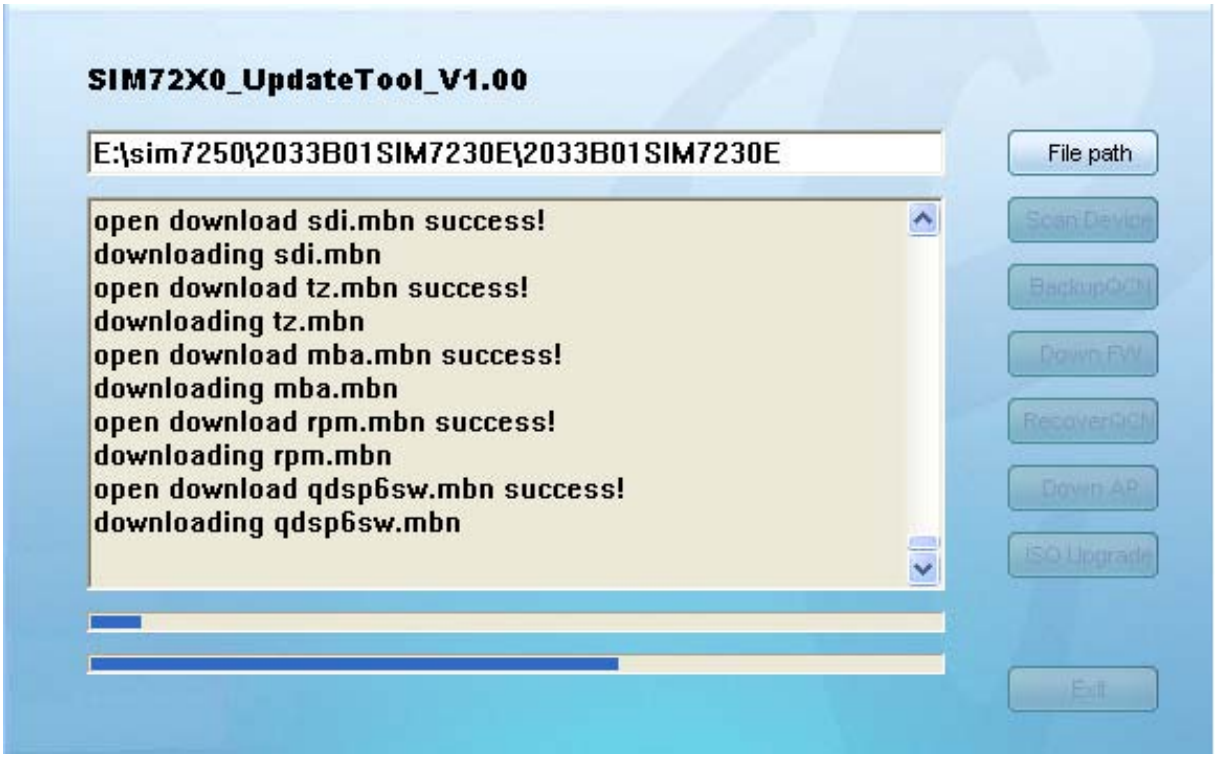

Figure 29: Downloading in process

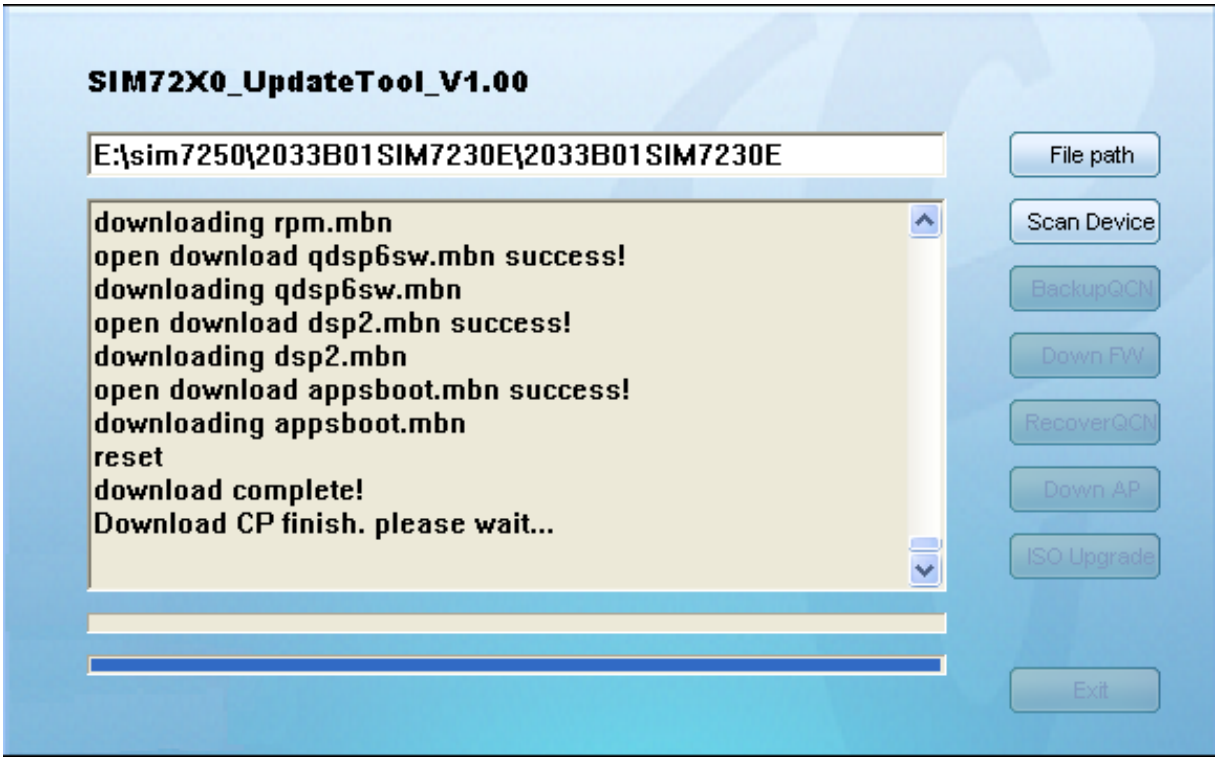

Figure 30: Downloading in process

Upgrade finished, tool will re enumeration and connection device, if device is ready.

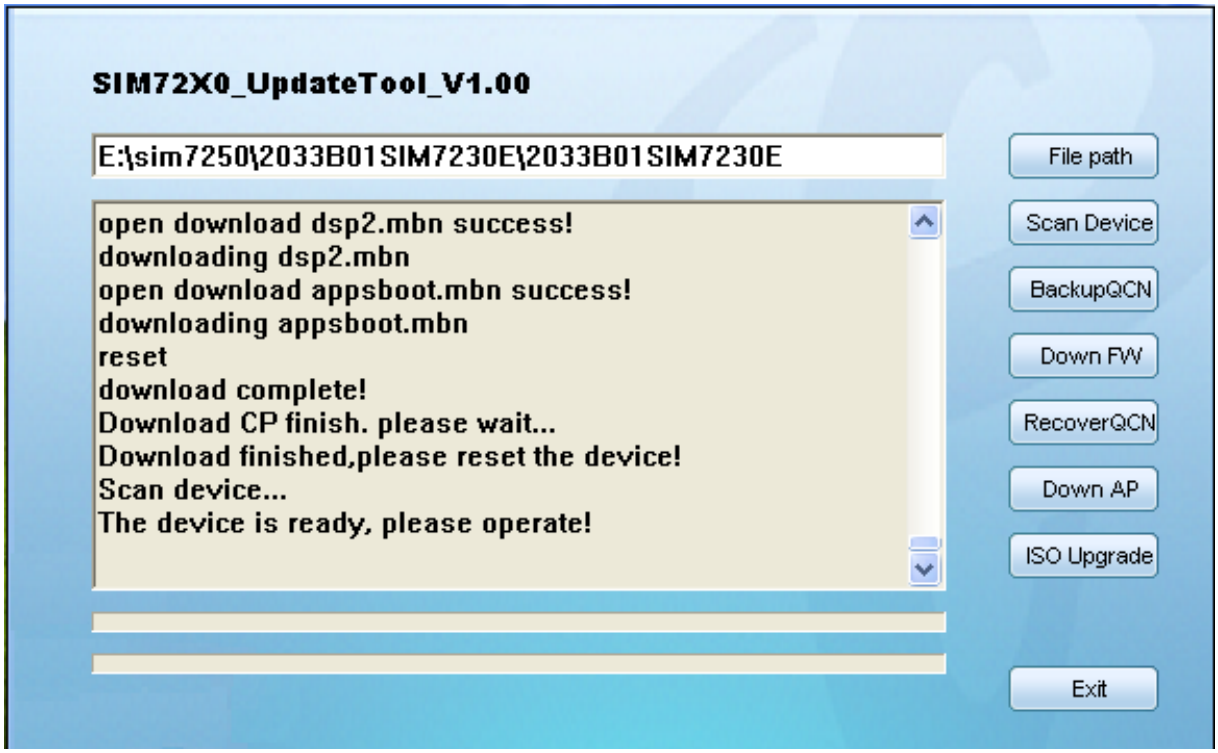

Figure 31: re enumeration and connection device

[RecoverQCN]

Click [RecoverQCN] button to recover QCN just backup.

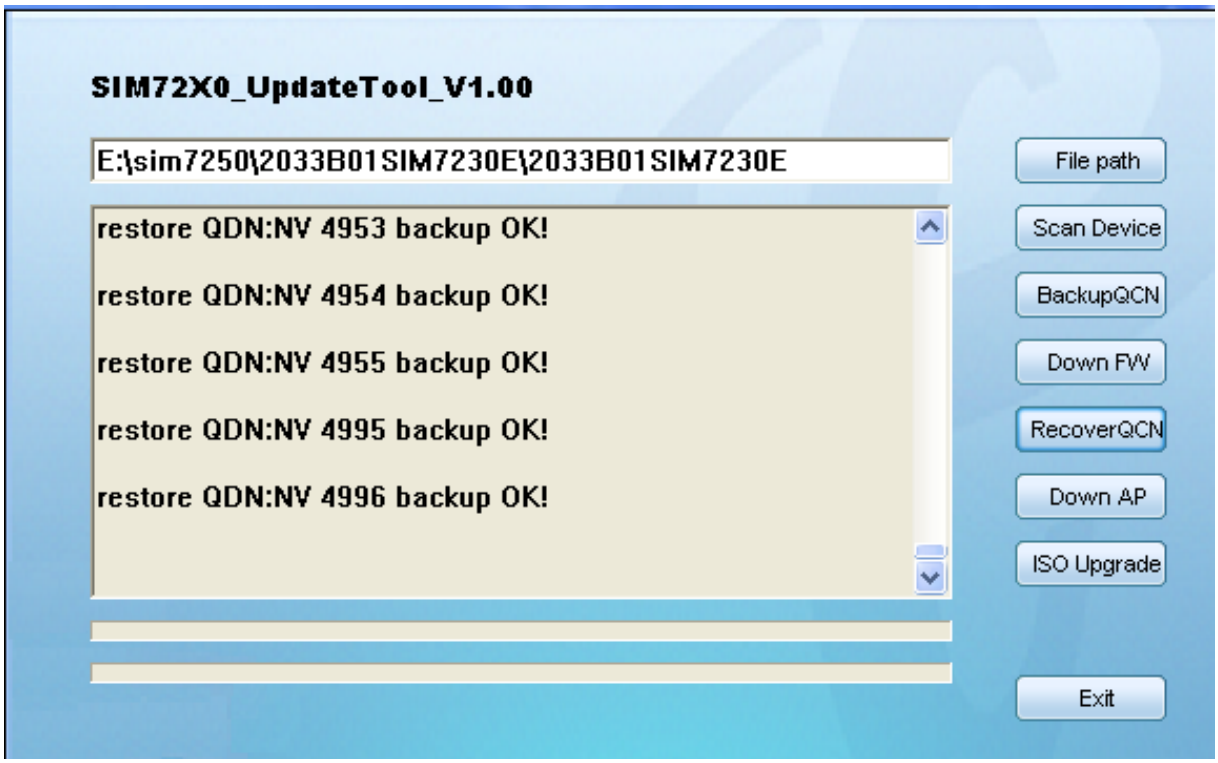

Figure 32: Recover QCN

Recover finished.

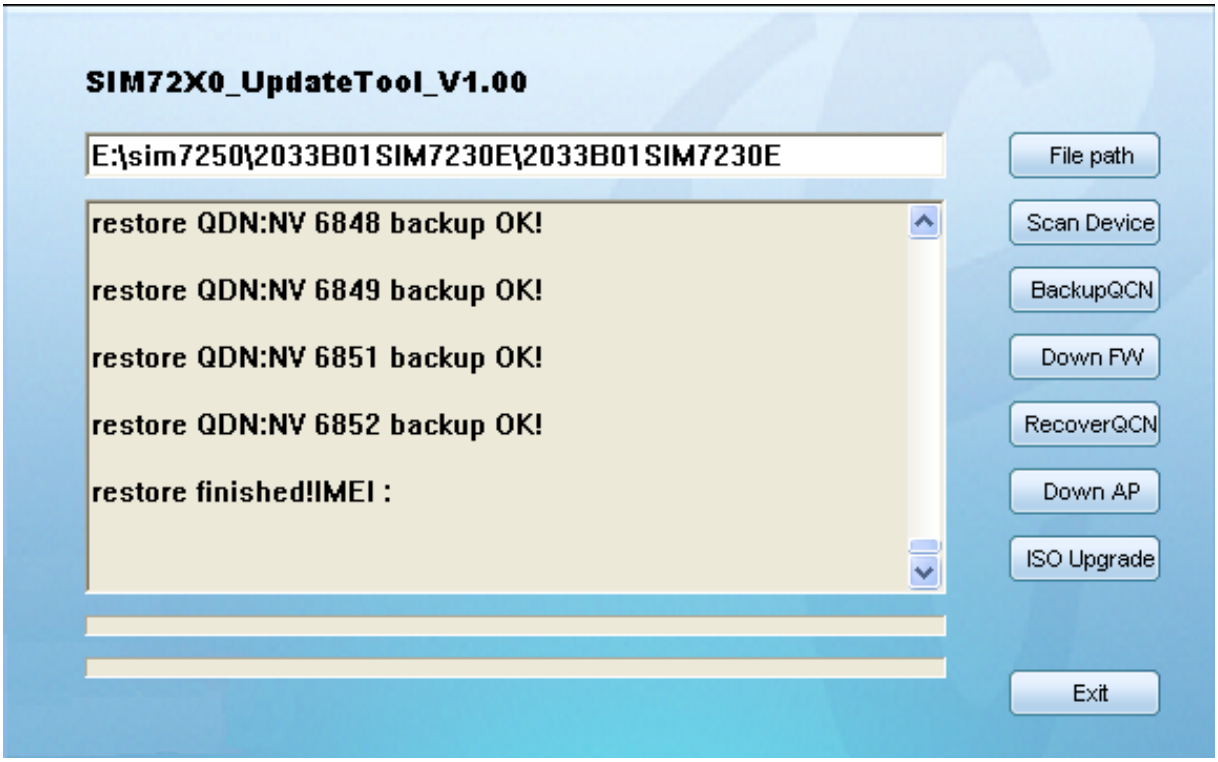

Figure 33: Recover QCN finished

[Down AP]

Click [Down AP] button to upgrade image file through ADB, If the first upgrade failed, will retry later. The tool set failure timeout monitoring time is 2 minutes.

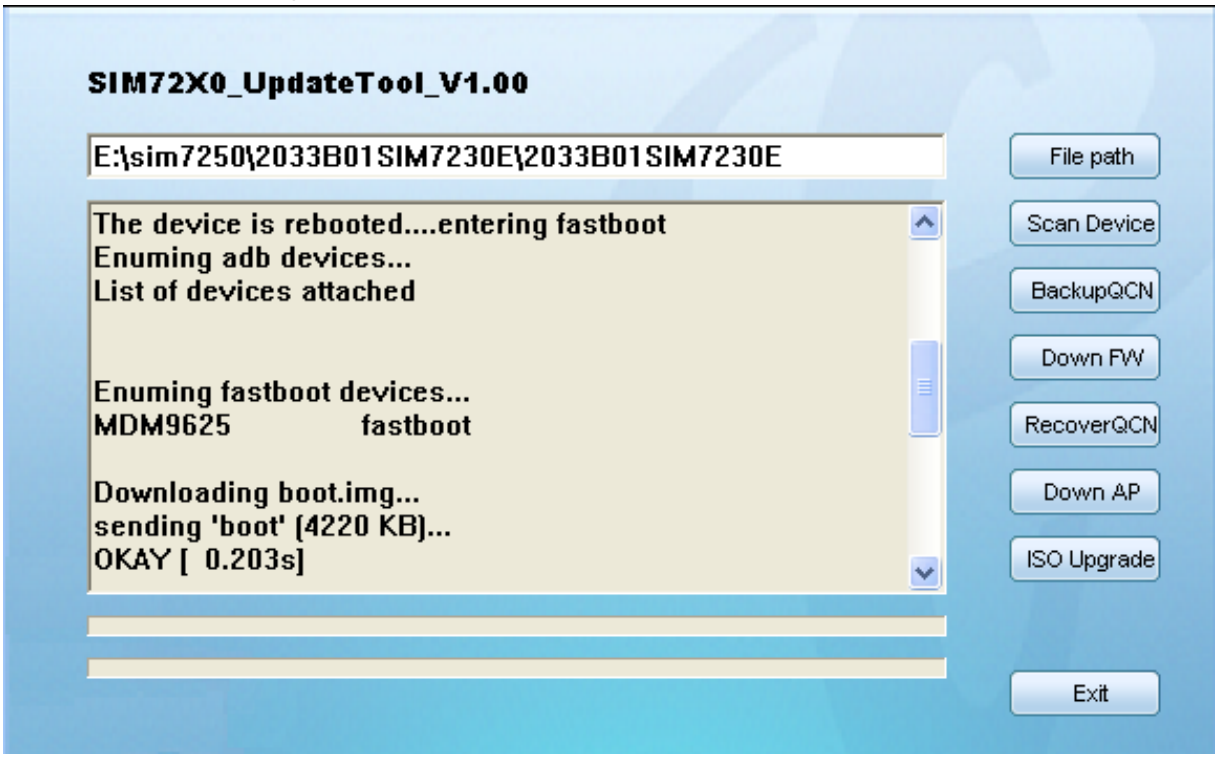

Figure 34: Down AP

Upgrade finished

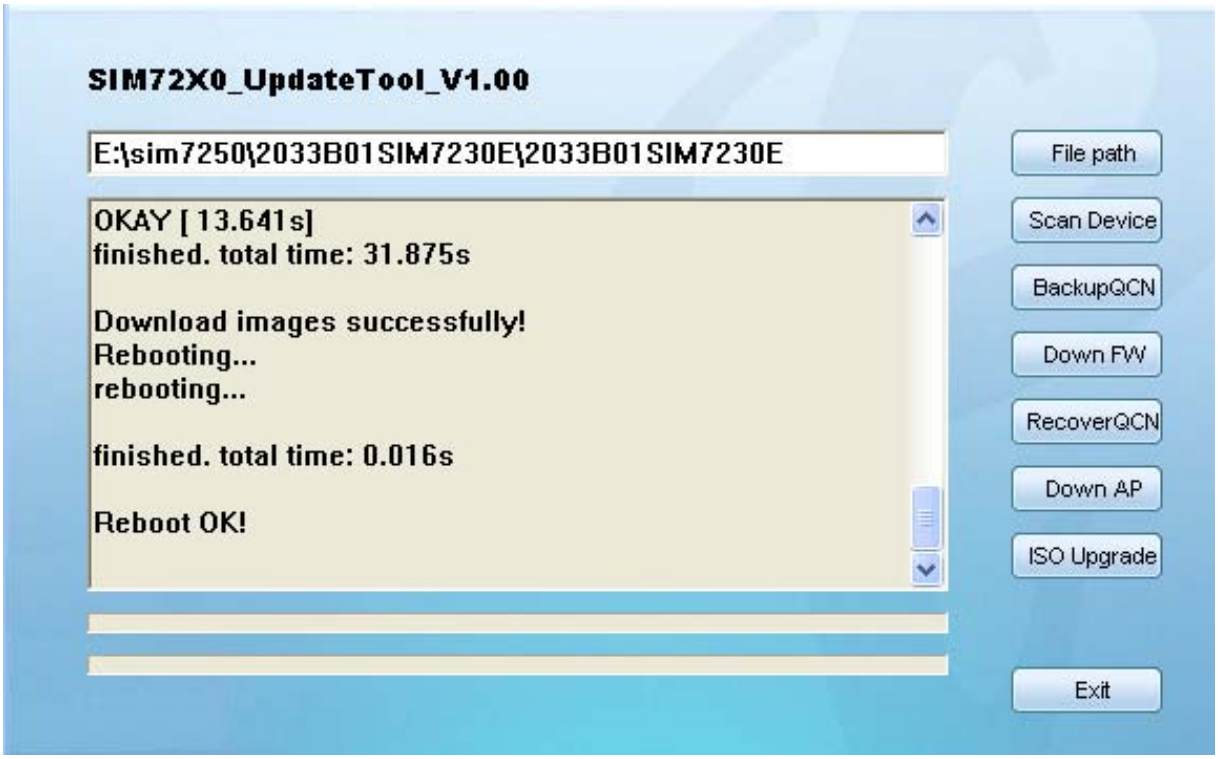

Figure 35: Down AP finished

[ISO Upgrade]

Click [ISO Upgrade] button to push the file named cdrom_install.iso in the ISO folder into the module's CD ROM , for the installation of PC management software.

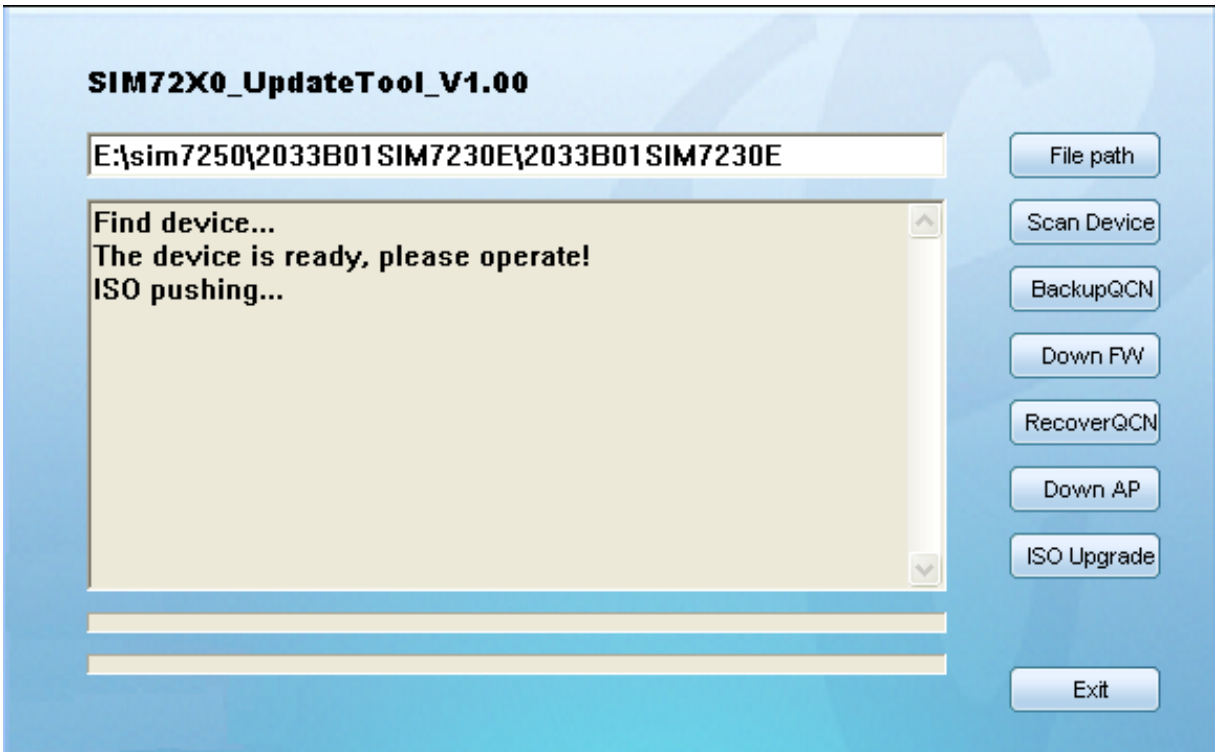

Figure 36: ISO Upgrade

Push finished

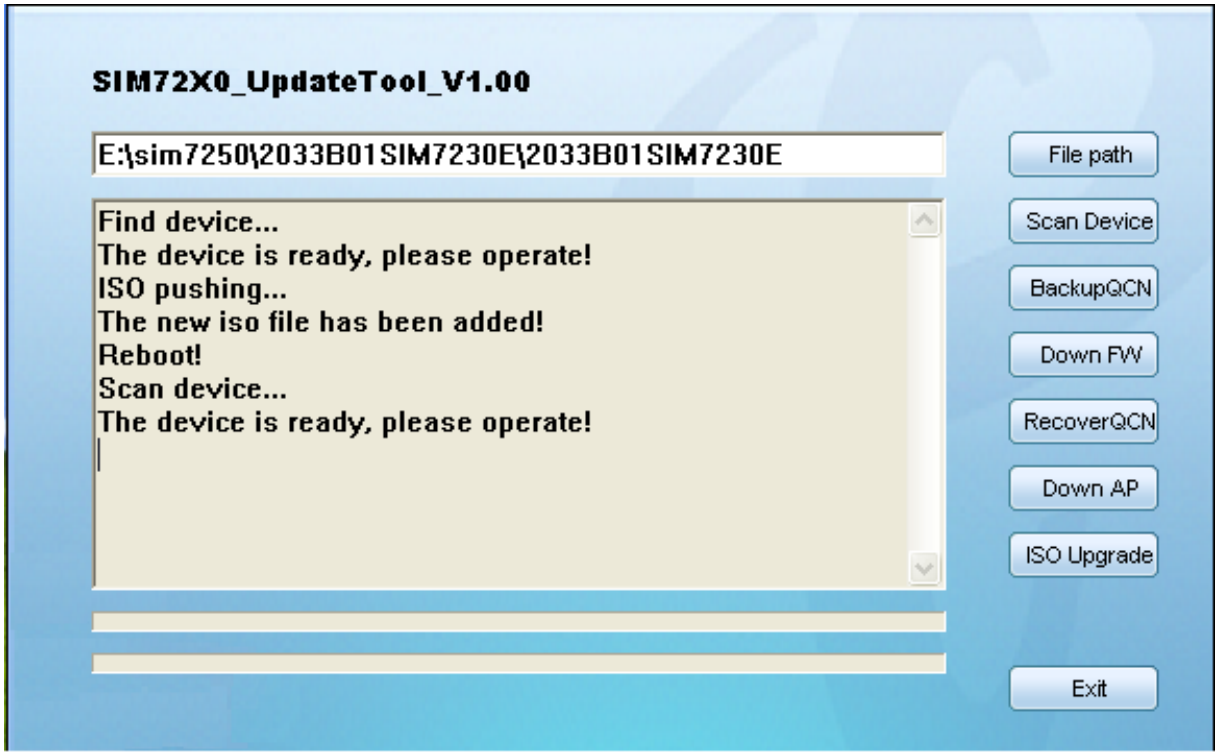

Figure 37: Push finished

7. Appendix

I. Related Documents

Table 12: Related Documents

SN	Document name	Remark
[1]	SIMCOM_SIM72X0_ATC_EN_VX.XX.doc	
[2]	SIM7250_Hardware_Design_VX.XX	

II. Safety Caution

Table 13: Safety caution

Marks	Requirements
	When in a hospital or other health care facility, observe the restrictions about the use of mobiles. Switch the cellular terminal or mobile off, medical equipment may be sensitive to not operate normally for RF energy interference.
	Switch off the cellular terminal or mobile before boarding an aircraft. Make sure it is switched off. The operation of wireless appliances in an aircraft is forbidden to prevent interference with communication systems. Forget to think much of these instructions may lead to the flight safety or offend against local legal action, or both.
	Do not operate the cellular terminal or mobile in the presence of flammable gases or fumes. Switch off the cellular terminal when you are near petrol stations, fuel depots, chemical plants or where blasting operations are in progress. Operation of any electrical equipment in potentially explosive atmospheres can constitute a safety hazard.
	Your cellular terminal or mobile receives and transmits radio frequency energy while switched on. RF interference can occur if it is used close to TV sets, radios, computers or other electric equipment.
	Road safety comes first! Do not use a hand-held cellular terminal or mobile when driving a vehicle, unless it is securely mounted in a holder for hands free operation. Before making a call with a hand-held terminal or mobile, park the vehicle.
	GSM cellular terminals or mobiles operate over radio frequency signals and cellular networks and cannot be guaranteed to connect in all conditions, for example no mobile fee or a invalid SIM card. While you are in this condition and need emergent help, please remember using emergency calls. In order to make or receive calls, the cellular terminal or mobile must be switched on and in a service area with adequate cellular signal strength. Some networks do not allow for emergency call if certain network services or phone features

	are in use (e.g. lock functions, fixed dialing etc.). You may have to deactivate those features before you can make an emergency call. Also, some networks require that a valid SIM card be properly inserted in the cellular terminal or mobile.

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