

# SIM7500\_SIM7600 Linux NDIS User Guide

## V2.01

### Version History

Data	Version	Description of change	Author
2016-08-22	V1.00	Original	Xiaobin.Wang
2016-10-25	V2.00	Modified	Xiaobin.Wang Jimmy.Zhang
2017-03-24	V2.01	Change simcom_wwan.c to sim7500_sim7600_wwan.c	Xiaobin.Wang

## 1 SIM7500\_SIM7600 USB Description

For SIM7500\_SIM7600 serial module, VID=0x1E0E, and PID=0x9001.

As a slave USB device, SIM7500\_SIM7600 USB is enumerated as listed below.

Interface number		
0	USB serial	Diagnostic Interface
1	USB serial	GPS NMEA Interface
2	USB serial	AT port Interface
3	USB serial	Modem port Interface
4	USB serial	USB Audio Interface
5	USB Net	wwan interface

## 2 Install USB Serial Driver

### 2.1 Precondition.

To configure Linux kernel, and make sure that:

```
CONFIG_USB_SERIAL=y
CONFIG_USB_SERIAL_WWAN=y
CONFIG_USB_SERIAL_OPTION=y
```

## 2.2 How to add SIM7500\_SIM7600 VID and PID, and skip interface #5.

To find the source code file *option.c* in kernel. (Usually, it is located in the path: *drivers/usb/serial/option.c*)

- If the kernel version is v3.2 or newer.

```
#define SIMCOM_SIM7600_VID          0x1E0E
#define SIMCOM_SIM7600_PID          0x9001

//for SIM7600 modem for NDIS
static const struct option_blacklist_info simcom_sim7600_blacklist = {
    .reserved = BIT(5),
};
Add into option_ids list
... ..

//for SIM7600 modem for NDIS
{ USB_DEVICE(SIMCOM_SIM7600_VID, SIMCOM_SIM7600_PID),
  .driver_info = (kernel_ulong_t)&simcom_sim7600_blacklist
},
... ..
```

- If the kernel version is below v3.2.

```
#define SIMCOM_SIM7600_VID          0x1E0E
#define SIMCOM_SIM7600_PID          0x9001

Add into option_ids list

{ USB_DEVICE(SIMCOM_SIM7600_VID, SIMCOM_SIM7600_PID)}, /*SIM7600 */
```

And skip interface #5 in *option\_probe*.

```
/* sim7600 */
if (serial->dev->descriptor.idVendor == SIMCOM_SIM7600_VID &&
    serial->dev->descriptor.idProduct == SIMCOM_SIM7600_PID &&
    serial->interface->cur_altsetting->desc.bInterfaceNumber == 5 )
    return -ENODEV;
```

## 2.3 How to print kernel debug message.

If USB serial driver is installed successfully, kernel will print below message automatically after module was re-started. And from this message, we could confirm if **dev/ttyUSB#** was enumerated successfully or not.

```
usb 1-1: new high speed USB device using rt3xxx-ehci and address 2
option 1-1:1.0: GSM modem (1-port) converter detected
usb 1-1: GSM modem (1-port) converter now attached to ttyUSB0
option 1-1:1.1: GSM modem (1-port) converter detected
usb 1-1: GSM modem (1-port) converter now attached to ttyUSB1
option 1-1:1.2: GSM modem (1-port) converter detected
usb 1-1: GSM modem (1-port) converter now attached to ttyUSB2
option 1-1:1.3: GSM modem (1-port) converter detected
usb 1-1: GSM modem (1-port) converter now attached to ttyUSB3
option 1-1:1.4: GSM modem (1-port) converter detected
usb 1-1: GSM modem (1-port) converter now attached to ttyUSB4
```

## 3 NDIS Dial up

### 3.1 Install USB Net Driver.

To configure Linux kernel, and make sure that:

```
CONFIG_USBNET=y
```

And then put **sim7500\_sim7600\_wwan.c** into the path **drivers/net/usb**. (Note: **sim7500\_sim7600\_wwan.c** is provided by SIMCom)

To modify **Makefile** file.

```
obj-$(CONFIG_USB_USBNET) += usbnet.o sim7500_sim7600_wwan.o
```

If installed successfully, kernel will print below message automatically after module was re-started.

```
sim7500_sim7600_wwan 1-1:1.5 wwan0: register 'sim7500_sim7600_wwan' at
usb-0000:02:03.0-1, SIMCOM wwan/QMI device, 8a:de:f6:67:ce:1b
```

### 3.2 Checking NIC (Network Interface Card) information.

“ifconfig” command can be used for checking NIC (Network Interface Card) information. (The status is “Down” by default)

```
wwan0    Link encap:Ethernet  HWaddr D6:D8:6C:10:B0:0E
          BROADCAST 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)
```

### 3.3 Dial up via NIC.

SIM7500\_SIM7600 module starts to dial up via NIC by using below command.

```
AT$QCRMCALL=1,1    // Start to dial up.
AT$QCRMCALL=0,1    // Disconnect.
```

**Note:** For more information, please refer to chapter 4.

### 3.4 Get NIC IP and DNS via DHCP.

After dial up via NIC, customer need get NIC IP and DNS via DHCP client.

If the host environment is Linux OS on PC (such as Ubuntu), just change NIC from “Down” to “Up”, and then PC will get IP and DNS via DHCP program which included in NetManager automatically.

If the host environment is embedded Linux OS, normally should use **udhcpc** command below.

```
udhcpc -i wwan0
```

After that, NIC information will be refreshed as below.

```
wwan0    Link encap:Ethernet  HWaddr D6:D8:6C:10:B0:0E
          inetaddr:10.47.77.207 Bcast:10.47.77.223 Mask:255.255.255.224
          inet6 addr: fe80::d4d8:6cff:fe10:b00e/64 Scope:Link
          UP BROADCAST RUNNING MULTICAST  MTU:1500  Metric:1
          RX packets:2 errors:0 dropped:0 overruns:0 frame:0
          TX packets:9 errors:0 dropped:0 overruns:0 carrier:0
          collisions:0 txqueuelen:1000
          RX bytes:612 (612.0 B)  TX bytes:1642 (1.6 KiB)
```

## 4 NDIS Dial up related AT command

### 4.1 AT\$QCRMCALL Dial up command.

AT\$QCRMCALL=<action>, <instance> [,<IP type> [,<Tech pref> [, <umts\_profile> [,<cdma\_profile> [,<APN> [,<username>,<password>[,<auth pref>]]]]]]]]

<action>

0- Stop

1 - Start

<instance>

1-Rmnet instance

<Ip type>

1- IPV4

2- IPV6

3- IPV4V6

<Tech pref>

1-3GPP2

2-3GPP

<umts profile>

1-16

<cdma profile>

1-200

<APN>

String of APN

<username>

Username for authentication

<password>

Password for authentication

<auth pref>

0- NONE

1- PAP

2- CHAP

3- PAP or CHAP

## 5 NDIS Dial up Cases

Firstly, please to be cleared that **Dial up** and **Attach network** are two conceptions. Attach work is the precondition of dial up, without network attached, dial up must be failed.

Secondly, for some LTE network, especially for some private network, it may ask for auth type, user name and password. So customer should set them correctly before dial up.

### 5.1 Public Network. (LTE, UMTS, GSM)

1. Make sure that SIM7500\_SIM7600 already register to the network; (please use **AT+CREG?, AT+CGREG?, AT+CPSI?**)
2. Start to dual up by using **AT\$QCRMCALL=1,1**  
(BTW, **AT\$QCRMCALL=0,1** used for disconnecting, **AT\$QCRMCALL?** used for checking the status. )
3. Get IP: **udhcpc -i wwan0**
4. Confirm network card information: **ifconfig**.

### 5.2 Private Network.

#### 5.2.1 Private Network. (UMTS, GSM)

1. Make sure that SIM7500\_SIM7600 already register to the network; (please use **AT+CREG?, AT+CGREG?, AT+CPSI?**)
2. Start to dual up by using  
**AT\$QCRMCALL=1,1,,,,,"apn","user name","password","auth pref"**
3. Get IP: **udhcpc -i wwan0**
4. Confirm network card information: **ifconfig**.

#### 5.2.2 Private Network. (LTE)

##### Mode #1: First register to public network, and then dial up to private network.

1. Make sure that SIM7500\_SIM7600 already register to the network; (please use **AT+CREG?, AT+CGREG?, AT+CPSI?**)
2. Start to dual up by using  
**AT\$QCRMCALL=1,1,,,,,"apn","user name","password","auth pref"**
3. Get IP: **udhcpc -i wwan0**
4. Confirm network card information: **ifconfig**.

##### Mode #2: First register to private network, and then dial up.

1. Set APN by using **AT+CGDCONT=1,"IP","apn"**
2. Set authentication type, user name and password by using  
**AT+CGAUTH=1,3,"password","user name"**
3. Make sure that SIM7500\_SIM7600 already register to the network; (please use **AT+CREG?, AT+CGREG?, AT+CPSI?**)

4. Start to dual up by using  
**AT\$QCRMCall=1,1**
5. Get IP: **udhcpc -i wwan0**
6. Confirm network card information: **ifconfig**.

### 5.3 CDMA/EVDO Network.

1. Make sure that SIM7500\_SIM7600 already register to the network; (please use **AT+CREG?, AT+CGREG?, AT+CPSI?.**)
2. Start to dual up by using **AT\$QCRMCall**; (Refer to notes below)
3. Get IP: **udhcpc -i wwan0**
4. Confirm network card information: **ifconfig**.

**Note:** Normally, there is no need to input user name and pass word during attached network process; But during dial up process, network ask for them.

So,

a) If under CDMA/EVDO public network;

Using **AT\$QCRMCall=1,1,,,,,"ctwap@mycdma.cn","vnet.mobi"**

b) If under CDMA/EVDO private network:

Using **AT\$QCRMCall=1,1,,,,,"user name","password"**