# SIM7100_SIM7500_SIM7600 Series_Sleep Mode_Application Note

**LTE Module**

| | |
|---|---|
| **Document Title:** | SIM7100_SIM7500_SIM7600 Series_Sleep Mode_Application Note |
| **Version:** | V3.00 |
| **Date:** | 2021.11.19 |
| **Status:** | Released |

## GENERAL NOTES

SIMCOM OFFERS THIS INFORMATION AS A SERVICE TO ITS CUSTOMERS, TO SUPPORT APPLICATION AND ENGINEERING EFFORTS THAT USE THE PRODUCTS DESIGNED BY SIMCOM. THE INFORMATION PROVIDED IS BASED UPON REQUIREMENTS SPECIFICALLY PROVIDED TO SIMCOM BY THE CUSTOMERS. SIMCOM HAS NOT UNDERTAKEN ANY INDEPENDENT SEARCH FOR ADDITIONAL RELEVANT INFORMATION, INCLUDING ANY INFORMATION THAT MAY BE IN THE CUSTOMER'S POSSESSION. FURTHERMORE, SYSTEM VALIDATION OF THIS PRODUCT DESIGNED BY SIMCOM WITHIN A LARGER ELECTRONIC SYSTEM REMAINS THE RESPONSIBILITY OF THE CUSTOMER OR THE CUSTOMER'S SYSTEM INTEGRATOR. ALL SPECIFICATIONS SUPPLIED HEREIN ARE SUBJECT TO CHANGE.

## COPYRIGHT

**SIMCom Wireless Solutions Limited**

SIMCom Headquarters Building, Building 3, No. 289 Linhong Road, Changning District, Shanghai P.R. China

Tel: +86 21 31575100

Email: simcom@simcom.com

**For more information, please visit:**

https://www.simcom.com/download/list-863-en.html

**For technical support, or to report documentation errors, please visit:**

https://www.simcom.com/ask/ or email to: support@simcom.com

# About Document

## Version History

| Version | Date | Owner | What is new |
|---------|------|-------|-------------|
| 2.00 | 2020.6.8 | Dongshan Liu | Update the format |
| 3.00 | 2021.11.19 | Haotian Wang | Update the format |

# Contents

# 1 Document Overview

This document presents the AT command of sleep mode operation and application examples. This document can apply to SIM7100_SIM7500_SIM7600_SIM7800 series modules.

# 2 Introduction

SIM7100/SIM7500/SIM7600/SIM7800 can enter into sleep mode automatically to conserve power when some conditions are satisfied. From working mode to sleeping mode, the module takes about 15 to 20 seconds. During sleeping mode, SIM7100/SIM7500/SIM7600/SIM7800 can still receive paging, SMS and voice call from network.

This document describes what conditions are required to make the module enter into sleep mode and how to wakeup the module or how to wakeup the host by module.

# 3 Sleep Condition

Several hardware and software conditions must be satisfied together in order to let SIM7100/SIM7500/SIM7600/SIM7800 enter into sleep mode:

1. UART condition
2. USB condition
3. Software condition

## 3.1    UART condition

**If TE do use UART interface**, must take care of this condition, DTR pin can be used as UART sleep indicator.

Host device must be send AT+CSCLK=1 command to module for enable sleep function, add use DTR as an indicator to let SIM7100/SIM7500/SIM7600/SIM7800 module enter into sleep mode or sleep mode.
    UART is ready to enter into sleep mode if DTR pin is pulled up.
    UART is ready to exit from sleep mode if DTR pin is pulled down.

**If TE does not use UART interface**, can be use AT+CUARTRM=1 disable UART function,and module will be ignore UART condition when it going to sleep.

**So module default cannot enter sleep mode, if module need sleep, UART must be enter sleep mode or disable mode.**

## 3.2  USB Condition

If use USB interface one must take care of this condition, otherwise will make this interface unconnected.

If host side CPU supports USB suspend mode, there has noting to do, since the USB controller will send suspend command to module if the BUS is idle for some time.

If host side CPU doesn't support USB suspend mode, host needs to cut off USB_VBUS line in order to let module enter into sleep mode. One can use a host GPIO to control an analog switch on/off.
If PC host is Windows OS, then needs to do items below.

### 3.2.1  USB Interface

The USB device is a composite device. Customer can use AT+CUSBPIDSWITCH to switch the USB PID, it provides eight PIDs from 9000 to 9007. Different PID composite device has different interface.   If the SIM700 module needs to go to sleep, the composite device can not have the ADB and mass storage interfaces, because if the composite has the ADB and mass storage interfaces .The PC host will not send the USB suspend command to the SIM700 module. The PID 9000 in default has not the adb and mass storage interfaces.

> **NOTE**
>
> User also can use the AT commmand to remove the adb and mass storage interfaces of the compostion device.
> AT+CUSBDELETEADB=1(SIM7100)
> AT+CUSBADB=0(SIM7500,SIM7600)

### 3.2.2  Windows registry

In the registry, under HKEY_LOCAL_MACHINE\SYSTEM\CurrentControlSet\services\ simusbser, define or redefine the following keys: QCDriverSelectiveSuspendIdleTime(DWORD) with a value 5 (may vary),
The key QCDriverSelectiveSuspendIdleTime defines the time (in seconds) for the host PC waits before the device entering into suspend. The value assigned to this key is a value range from 3 to 120 sec.

### 3.2.3  Device manager

a)   Navigate to the desired device, which, in this example, is the modem.
b)   Open the device's Properties.
c)   On the Power Management tab, check Allow the computer to turn off this device to save power.
d)   Then check Allow this device to wake the computer.
e)   Click OK.

If the host is the embed system. The host need send suspend command to make the USB suspend.

## 3.3  Software Condition

SIM7100/SIM7500/SIM7600/SIM7800 module must in idle mode (no data transmission, no audio playing, no other at command running and so on) in order to let SIM7100/SIM7500/SIM7600/SIM7800 module enter into sleep mode.

**Follow this table is module sleep conditions by connect port.**

| Condition  Connect port | UART | USB | Software |
|---|---|---|---|
| UART | ✓ | | ✓ |
| USB | ✓ | ✓ | ✓ |
| USB + UART | ✓ | ✓ | ✓ |

# 4 Wakeup Module

SIM7100/SIM7500/SIM7600/SIM7800 module can exit from sleep mode automatically when the following events are satisfied:

● Receive a SMS.
● Have an Incoming call.

SIM7100/SIM7500/SIM7600/SIM7800 module can exit from sleep mode manually when the following events are happened:

● UART event, DTR is pulled down if wants to wakeup module.
● USB event

Host sends a command to module when in suspend mode or Host connects the USB interface when host cuts off the USB_VBUS line.

# 5 Wakeup Host

In UART SIM7100/SIM7500/SIM7600/SIM7800 uses RI pin to wake up the host only when incoming call happened, SMS received, and URC reported.
RI pin has same patterns to wakeup the host; the pin will stay high normally:

When URC reported this pin will set to low about 60ms to inform host and then reset to high automatically, depend on (AT+CFGRI=1).

When SMS received this pin will set to low about 120ms to inform host and then reset to high automatically.

When incoming voice call happened this pin will set to low about 5900ms and set to high about 100ms to inform host, it will loop this action until the host reset this pin with answer or hang up this call.

When incoming CSD call happened this pin will set to low about 100ms and set to high about 5900ms to inform host, it will loop this action until the host reset this pin with answer or hang up this call.

> **NOTE**
>
> 1 If user set the AT + CFGRI =1, the pin "RI" will be set low by receiving SMS , incoming voice (CSD) call and any URC report.
> 2 If user set the AT + CFGRI =0(Default setting), the pin "RI" will be set low by receiving SMS and incoming voice (CSD) call only.
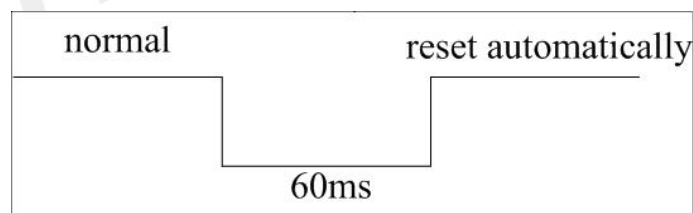> 3 SIM7500/SIM7600 does not support CSD feature.

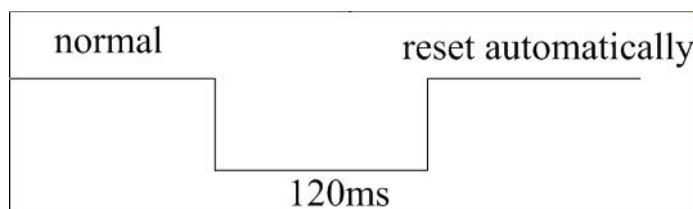**Figure 1: UART RI behavior when URC reported**

**Figure 2: UART RI behavior when SMS received**

# 6 Sleep or wakeup state

Module can use NETLIGHT pin as an indicator of sleep or wakeup state, NETLIGHT pin only depend on UART state add network state, don't care USB state.

If module from wakeup to sleep state, NETLIGHT pin set to low.

If module from sleep to wakeup state, NETLIGHT pin set to high, add NETLIGHT pin will be goto breathing state, in breathing state, breathing rate depends on network state.

The LED status is listed in the following table.

| LED Status | Module Status |
|---|---|
| On | Searching Network; Call Connect(include VOLTE, SRLTE) |
| 200ms On, 200ms Off | Data Transmit; 4G registered |
| 800ms On, 800ms Off | 2G/3G registered network |
| Off | Power off; Sleep |

Table 1: Network Status Indication LED Status