FIBOCOM AT Commands User Manual_Sleep

Version: V1.0.4
Date: 2019-11-06

Applicability type

No.	Product model	Description
1	NL668-CN-00/01/02/03/04	
2	NL668-EAU-00	NA
3	NL668-EU-00/01/03	NA
4	NL668-AM-00/01	NA
5	NL668-JP-00/01	NA
6	NL668-LA-00	NA
7	NL661-EU-00	NA
8	NL668-CN-10	NA

Copyright

Notice

The document is subject to update from time to time owing to the product version upgrade or other reasons. Unless otherwise specified, the document only serves as the user guide. All the statements, information and suggestions contained in the document do not constitute any explicit or implicit guarantee.

Trademark

The trademark is registered and owned by Fibocom Wireless Inc.

Versions

Version	Author	Assessor	Approver	Update Date	Description
V1.0.0	Black.feng			2019-03-27	Initial version
V1.0.1	Guowenhui			2019-05-24	Update +WRIM / GTUSBSLEEPEN / GTWAKE / CSCLK / GTLPMMODE commands
V1.0.2	Longyiliang			2019-08-16	Add applicable model
V1.0.3	Zhaohong			2019-10-14	Add NL668-CN-10
V1.0.4	Chenning			2019-11-06	Add NL668-EU-01

Contents

1 Sleep Mode Command

1.1 S24, Set the Time of Enter Sleep Mode

Description

This command is used to set the time of the module enter sleep mode.

Note: This command is applicable when not allow UART automatically go into sleep mode, or else it will return error.

Syntax

Command	Possible response(s)
ATS24=<value>	OK Or: ERROR
ATS24?	<value> OK

Attributes

Pin Restricted	Persistent	Sync Mode	Effect Immediately	Time of duration
No	No	Yes	Yes	< 1s

Defined Values

<value>: integer type and in seconds

  000   Disable the module enter sleep mode. Default value;

  Other value   Enable the module enter sleep mode after a specified time.

1.2 +GTWAKE, Enable waking up host function

Description

This command is used to enable or disable wake up host function.

Syntax

Command	Possible response(s)
AT+GTWAKE=<mode>[,<sub_mode>]	OK Or: ERROR
AT+GTWAKE?	+GTWAKE: <mode>[,<sub_mode>] OK
AT+GTWAKE=?	+GTWAKE: (list of supported <mode>s),(list of supported <sub_mode>s) OK

Attributes

Pin Restricted	Persistent	Sync Mode	Effect Immediately	Time of duration
No	No	Yes	Yes	< 1s

Defined Values

<mode>: integer type

 0 Disable waking up host function. Default value.

 2 Enable waking up host function via UART RI pin.

<sub_mode>: integer type

 0 Module set RI pin to high level when want host wake up. Default value.

 1 Module set RI pin to low level when want host wake up.

⚠ **Note:**

When GTWAKE = 0, the action of the RI pin operates according to the action of the 9-pin serial port protocol, and the RI pin level hold time is set by WRIM. The RI pin is operated before PING, CMT, CMTI, MIPRTCP, MIPRUDP, MIPREAD, TCP transparent transmission. At this time, the action of the RI pin has nothing to do with whether it is hibernating or not, and has nothing to do with the setting value of GTPMTIME.

When GTWAKE=2,0 or GTWAKE=2,1, the RI pin acts as a normal I/O and is no longer operated

according to the RI pin in the 9-pin serial protocol. Instead, as long as there is an unsolicited result code, the RI pin will act according to the configuration of GTWAKE and GTPMTIME. This has nothing to do with the WRIM settings.

1.3 +GTLPMMODE，Set Wake up And Sleep Mode

Description

This command control the module how to enter sleep or wake up from sleep.

Syntax

Command	Response/Action
+GTLPMMODE=<main_mode>[,<sub_mode>]	OK or: +CME ERROR: <err>
+GTLPMMODE?	+GTLPMMODE: <main_mode>[,<sub_mode>] OK or: +CME ERROR: <err>
+GTLPMMODE=?	+GTLPMMODE: (list of supported <main_mode>s),(list of supported <sub_mode>s) OK

Attributes

Pin Restricted	Persistent	Sync Mode	Effect Immediately	Time of duration
No	Yes	Yes	Yes	< 1s

Defined Values

<main_mode>: integer type and range 0-2;

0 Use the command ATS24 to control module enter sleep;Default value.

1 Control module go into sleep/wakeup mode via WAKEUP pin level only.

2 Control module go into sleep/wakeup mode via UART DTRpin level only

<sub_mode>: integer type and range 0-1; It takes effect only when <main_mode>=1 or 2.

0   Module enters sleep mode when WAKEUP/DTRpin turns to high level, and wake up module in

low   level. Default value.

1   Module enters sleep mode when WAKEUP/DTRpin turns to low level, and wake up module in

high level.

Note: ATS24 doesn't take effect when <main_mode>=1 or 2.

The default value is 1,1 for NL668-EU-01

1.4 +GTPMTIME Delay time for send data

Description

This command control the delay time for send data.

Syntax

Command	Response/Action
+GTPMTIME=<delay-out>[,<delay-in>[,<sleep time>]]	OK or: +CME ERROR: <err>
+GTPMTIME?	+GTPMTIME: <delay-out>,<delay-in>,<sleeptime> OK
+GTPMTIME=?	+GTPMTIME: (100-1000),(100-1000),(1000-5000) OK

Attributes

Pin Restricted	Persistent	Sync Mode	Effect Immediately	Time of duration
No	Yes	Yes	Yes	< 1s

Defined Values

<delay-out>: integer type and range 100-1000 ms, default is 200;

> Note: Module will wait thisdelay time for send data after wakeup host signal has been set.

<delay-in>: integer type and range 100-1000 ms, default is 200;

> Note: Host will wait this delay time for send data after wakeup module signal has been set.

<sleeptime>: integer type and range 1000-5000 ms, default is 2000;

> Note: The module will go into sleep mode after wakeup by WAKEUP/DTR pin pulse.

1.5 +WRIM, RI signal width setting

Description

This command is used to set the duration timeofRI pulse with low voltage when modem receives a SMS or Call or data.

⚠️ **Note:**

> the RI pin will keep on high voltage if there is no incoming SMS or call or dat**a.**

Syntax

Command	Possible response(s)
AT+WRIM=<type>,<duration>	OK or: ERROR
AT+WRIM?	+WRIM: <type>,<duration> OK or: ERROR
AT+WRIM=?	+WRIM: (list of supported <type>s),(list of supported <duration>s) OK or ERROR

Attributes

Pin Restricted	Persistent	Sync Mode	Effect Immediately	Time of duration
No	No	Yes	Yes	< 1s

Defined Values

<type>: integer type

    0   take effect on voice call

    1   take effect on SMS

    2   take effect on TCP/IP data

<duration>: integer type; Default value is 0

    0   means default setting : < type>,<duration> as (0,1000) and (1,150) and (2,0)

    1 to 2000   1～2000ms

⚠️ **Note:**

    SMS wake-up needs to be enabled for SMS reporting via the CNMI at command.

1.6 +CSCLK, Configure Whether or not to Enter into Sleep Mode

Description

AT command "AT+CSCLK" is used to control whether the module enters into sleep mode. When AT+CSCLK is enabled and WAKEUP_IN or UART_DTR is pulled to sleep level, the module can directly enter sleep mode. If AT+CSCLK is enabled and WAKEUP_IN or UART_DTR is pulled to wake level, the module can't directly enter sleep mode.

Syntax

Command	Response/Action
+CSCLK=<mode>	OK or: ERROR
+CSCLK?	+CSCLK: <mode>

Command	Response/Action
	OK or: ERROR
+CSCLK=?	+CSCLK: (0-1) OK or: ERROR

Attributes

Pin Restricted	Persistent	Sync Mode	Effect Immediately	Time of duration
Yes	No	Yes	Yes	< 1s

Defined Values

<mode>: integer type and range 0-1 select WAKEUP_IN or UART_DTR

    0   Disable slow clock

    1   Enable slow clock, it is controlled by UART_DTR or WAKUP_IN.

1.7 +GTUSBDETECTEN Enable or Disable USB Detect Function

Description

AT command "AT+GTUSBDETECTEN" is used to control enable or disable usb detect by check USB_VBUS pin. When module's hardware support USB_VBUS pin detect, you can using the command to enable or disable USB Detect function.

Syntax

Command	Response/Action
+GTUSBDETECTEN=<mode>	OK or: ERROR
+GTUSBDETECTEN ?	+GTUSBDETECTEN : <mode> OK or: ERROR
+GTUSBDETECTEN =?	+GTUSBDETECTEN : (0-1) OK or: ERROR

Attributes

Pin Restricted	Persistent	Sync Mode	Effect Immediately	Time of duration
Yes	Yes	Yes	Yes	< 1s

Defined Values

<mode>: integer type and range 0-1 enable or disable

    0   Disable USB Detect
    1   Enable USB Detect

1.8 +GTUSBSLEEPEN Enable or Disable USB Auto Enter Low Power Mode

Description

AT command "AT+GTUSBSLEEPEN" is used to control enable or disable USB auto enter LPM when hardware no support USB Detect and USB plug in and out happen. But sometimes, when module's hardware no connect with USB Detect, you can using the command with param no_vbus to enable or

disable USB auto enter Low Power Mode.

Syntax

Command	Response/Action
+GTUSBSLEEPEN=<mode>,<no_vbus>	OK or: ERROR
+GTUSBSLEEPEN ?	+GTUSBSLEEPEN : <mode>,<no_vbus>,<usb_status> OK or: ERROR
+GTUSBSLEEPEN =?	+GTUSBSLEEPEN : (0-2),(0-1) OK or: ERROR

Attributes

Pin Restricted	Persistent	Sync Mode	Effect Immediately	Time of duration
Yes	Yes	Yes	Yes	< 1s

Defined Values

<mode>: integer type and range 0-2，USB Low Power Mode status

    0   USB(support resume/suspend)+UART

    1   USB(no support resume/suspend, and using USB_VBUS)+UART

    2   UART

<no_vbus>: integer type and range 0-1，connect or disconnect USB_VBUS or virtual USB_VBUS

    0   Connect USB_VBUS or virtual USB_VBUS, if set we support hardware or software detect. (only support USB+UART or USB condition)

    1   Disconnect USB_VBUS or virtual USB_VBUS, if set we no support hardware and software detect. (only using UART condition)

<usb_status>: integer type and range 0-1,

    0   Current USB status is SUSPEND

   1   Current USB status is RESUME

⚠️ **Note:**

After the module is sent "AT+GTUSBSLEEPEN=2,x" or "AT+GTUSBSLEEPEN=1,1" command, if need to change other sleep modes, please power on again (using no USB_VBUS) or re-insert USB (using USB_VBUS).

2 Sleep Mode Command

2.1 UART Condition

The operation is as follows:

1: send AT+CSCLK=1 to device.

2: send AT+GTUSBSLEEPEN=2,0 to device

3: pull UART_DTR pin to sleep level.

4: pull UART_DTR pin to wakeup level.

5: when URC need to report, UART_RI pin will wakeup host. UART_RI pin see the command AT+GTWAKE.

6: using AT+GTLPMMODE set autosleep mode and using ATS24=xxx set autosleep timer, when autosleep timeout, device will go to sleep, and if device rx receive data, device will auto wakeup.
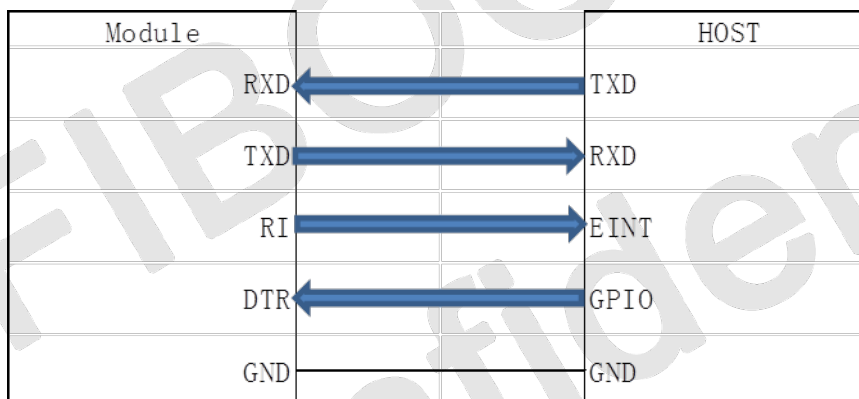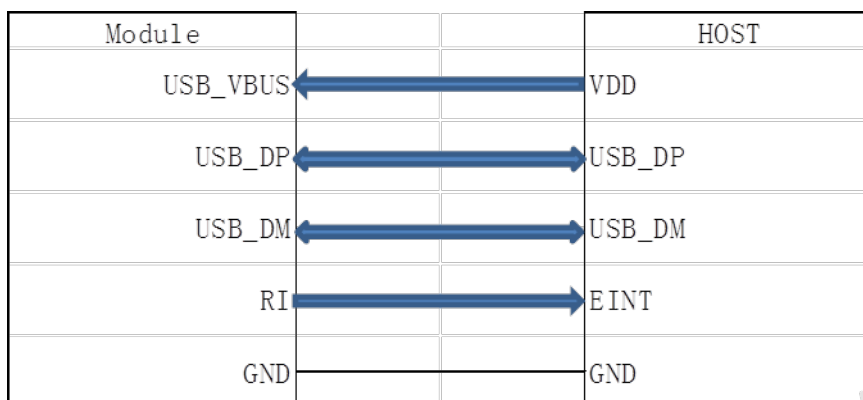

2.2 USB Condition (support usb remote wakeup)

If host support USB suspend/resume and support USB remote wakeup.(remote wakeup need usb protocol support remote wakeup, so it is recommended to add UART_RI pin)
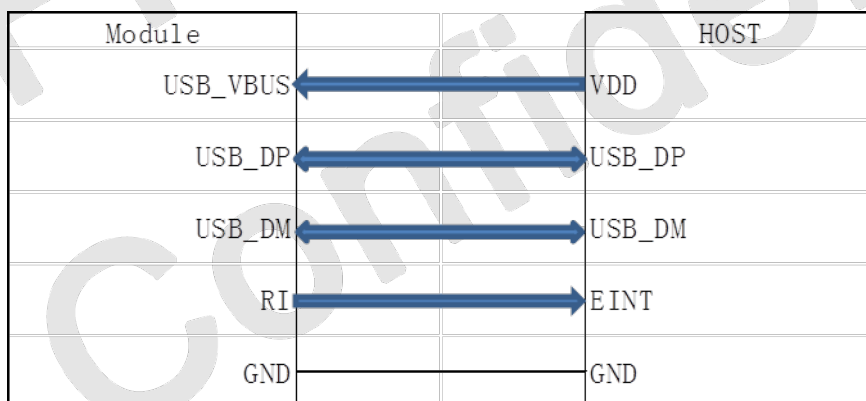
The operation is as follows:

1: send AT+CSCLK=1 to device.

2: pull WAKEUP_IN pin to sleep level.

3: host usb suspend to device to sleep.

4: host usb can resume to wakeup device, or when URC need to report, device usb will remote wakeup host usb.

2.3 USB Condition(support usb suspend/resume and uart ri)

The operation is as follows:

1: send AT+CSCLK=1 to device.

2: pull WAKEUP_IN pin to sleep level.

3: host usb suspend to device to sleep.

4: host usb can resume to wakeup device, or when URC need to report, UART_RI will wakeup host

2.4 USB Condition(not support usb suspend/resume)

If host not support USB suspend/resume, host will disconnect USB_VBUS power, let device enter sleep.

The operation is as follows:

1: Make sure USBDETECTEN is enable, if disable, please send AT+GTUSBDETECTEN=1 to device.

2: send AT+CSCLK=1 to device.

3: pull WAKEUP_IN pin to sleep level.

4: disconnect USB_VBUS power to sleep.

5: host usb can resume to wakeup device, or when URC need to report, UART_RI will wakeup host.