

# Power State Management For WizFi210

(WizFi 210 Application Notes)



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## 1. Power State Management

### 1.1. Enable/Disable SOC Deep Sleep

The command to enable the WizFi210's power-saving Deep Sleep processor mode is AT+PSDPSLEEP

When enabled, the SOC will enter the power-saving Deep Sleep mode when no actions are pending. In Deep Sleep mode, the processor clock is turned off, and SOC power consumption is reduced to less than 1mW. Note that other components external to the SOC may continue to dissipate power during this time, unless measures are taken to ensure that they are also off or disabled.

The processor can be awakened by sending data on the serial port. However, several milliseconds are required to stabilize the clock oscillator when the system awakens from Deep Sleep. Since the clock oscillator must stabilize before data can be read, the initial data will not be received; "dummy"(discardable)characters or commands should be sent until an indication is received from the application.

### 1.2. Request Standby Mode

The command to request a transition to ultra-low-power Standby operation is

AT+PSSTBY=x[,<DELAY TIME>,<ALARM1 POL>,<ALARM2 POL>]

The parameters are:

- x is the Standby time in milliseconds. If a delay time(see below)is provided, the Standby count begins after the delay time has expired.
- DELAY TIME is the delay in milliseconds from the time the command is issued to the time when the SOC goes to Standby.
- ALARM1 POL is the polarity of the transition at pin 7 of the WizFi210 which will trigger an alarm input and waken the WizFi210 from Standby. A value of 0 specifies a high-to-low transition as active; a value of 1 specifies low-to-high.
- ALARM2 POL is the polarity of the transition at pin 11 that triggers an alarm input, using the same convention used for Alarm1.

The parameters DELAY TIME, ALARM1 POL, and ALARM2 POL are optional. Specifying an alarm polarity also enables the corresponding alarm input.

When this command is issued, the WizFi210 will enter the ultra-low-power Standby state(after the optional delay time if present), remaining there until x milliseconds have passed since the command was issued, or an enabled alarm input is received. Any current CID's are lost on transition to Standby.

In Standby, only the low-power clock and some associated circuits are active. Serial messages sent to the UART port will not be received. The radio is off and packets cannot be sent or received. Therefore, before requesting a transition to Standby, the requesting application should ensure that no actions are needed from the interface until the requested time has passed, or provide an alarm input to waken the SOC when needed. The alarm should trigger about 10 msec prior to issuance of any serial commands.

## 2. Example of Standby Mode in TCP Communication

### 2.1. AP Association

Associate with AP.

```
ATC0  
[OK]  
  
AT+WD  
[OK]  
  
AT+WWPA=12345678  
[OK]  
  
AT+NDHCP=1  
[OK]  
(Associate to the AP)  
  
AT+WA=WizFiDemoAP  
  
IP      SubNet  Gateway  
192.168.3.111: 255.255.255.0: 192.168.3.1  
[OK]
```

If you enable auto connection(ATC1), you can show error message before restoring network connection. Thus you must not enable auto connection(ATC0).

## 2.2. Store Network Connection Information & Standby

1. Connect to TCP server. ( IP : 192.168.3.103, Port : 5000 )
2. Sending data 10byte.  
( Data : ABCDEFGHIJ, <Esc> : Press <Esc> in your keyboard )
3. Store network connection parameters prior to transition to standby.
4. WizFi210 close all open connections.
5. Request transition to Standby for 10000 milliseconds.

```
AT+NCTCP=192.168.3.103,5000
[OK]

(Sending data 10 byte - Start)
<Esc>S0ABCDEFGHIJ<Esc>E
(Sending data 10 byte - End)

(Store Network Context)
AT+STORENWCONN
[OK]

AT+NCLOSEALL
[OK]

(Transit to Standby mode for 10 seconds)
AT+PSSTBY=10000
```

Received data
ABCDEFGHIJ

**TCP Server**

## 2.3. Restore Network Connection & Send Data

1. Restore network connection parameters after wake from standby.
2. Connect to TCP server and data send.
3. Close all open connections and Request transition to standby for 10000 milliseconds
4. If you repeat this procedure five times, you will get result as below.

```
AT+RESTORENWCONN
[OK]

AT+NCTCP=192.168.3.103,5000
[OK]

(Sending data 10 byte - Start)
<Esc>S0ABCDEFGHIJ<Esc>E
(Sending data 10 byte - End)

AT+NCLOSEALL
[OK]

AT+PSSTBY=10000
.
.
.
Repeated Five Times
```

Received data
ABCDEFGHIJ
ABCDEFGHIJ
ABCDEFGHIJ
ABCDEFGHIJ
ABCDEFGHIJ

**TCP Server**

### 3. Example of Standby Mode in UDP Communication

#### 3.1. AP Association

Associate with AP.

```
ATC0
[OK]

AT+WD
[OK]

AT+WWPA=12345678
[OK]

AT+NDHCP=0
[OK]
(Associate to the AP)

AT+WA=WizFiDemoAP

  IP      SubNet    Gateway
192.168.3.111: 255.255.255.0: 192.168.3.1
[OK]
```

If you enable auto connection(ATC1), you can show error message before restoring network connection. Thus you must not enable auto connection(ATC0).

## 3.2. Store Network Connection Information & Standby

1. Connect to destination IP. ( IP : 192.168.3.103, Port : 5000 )
2. Sending data 10byte.  
( Data :UDP\_\_\_\_MSG, <Esc> : Press <Esc> in your keyboard )
3. Store network connection parameters prior to transition to standby.
4. WizFi210 close all open connections.
5. Request transition to Standby for 10000 milliseconds.

```
AT+NCUDP=192.168.3.103,5000
[OK]

(Sending data 10 byte - Start)
<Esc>S0UDP__MSG<Esc>E
(Sending data 10 byte - End)

(Store Network Context)
AT+STORENWCNN
[OK]

AT+NCLOSEALL
[OK]

(Transit to Standby mode for 10 seconds)
AT+PSSTBY=10000
```

Received data
UDP____MSG
UDP



### 3.3. Restore Network Connection & Send Data

1. Restore network connection parameters after wake from standby.
2. Restore network connection parameters after wake from standby.
3. Connect to TCP server and data send.
4. Close all open connections and Request transition to standby for 10000 milliseconds
5. If you repeat this procedure five times, you will get result as below.

```
AT+RESTORENWCONN
[OK]

AT+NCUDP=192.168.3.103,5000
[OK]

(Sending data 10 byte - Start)
<Esc>S0UDP__MSG<Esc>E
(Sending data 10 byte - End)

AT+NCLOSEALL
[OK]

AT+PSSTBY=10000
.
.
.
Repeated Five Times
```

Received data
UDP__MSG
UDP__MSG
UDP__MSG
UDP__MSG
UDP__MSG

**UDP**

## 4. Battery Check

### 4.1. Battery Check Start

The command to initiate battery checking is:

```
AT+ BCHKSTRT=<Batt.chk.freq>
```

The valid range for the parameter Batt.chk.freq is between 1 and 100. Upon deployment of this command, the adapter performs a check of the battery voltage each Batt.chk.freq number of sent packets, and stores the resulting value in nonvolatile memory; only the most recent value is stored. Note that battery checks are performed during packet transmission to ensure that they reflect loaded conditions. Battery checks can be used to ensure that a battery-powered system is provided with sufficient voltage for normal operation. Low supply voltages can result in data corruption when profile data is written to flash memory.

### 4.2. Battery Warning/Standby Level Set

The command to set the battery warning/standby level to enable the adaptor's internal battery measuring login;

```
AT+ BATTLVLSET=<Warning Level>,<Warning Freq>,<Standby Level>
```

Upon execution of this command the adaptor's internal battery level monitoring logic starts. This command should be executed before the battery check start command (4.1)

Warning Level : if the battery voltage, in millivolts,. Is low the adaptor sends the message "Battery Low" to the serial interface.

Warning Freq : is the frequency at which the adaptor sends the "Battery Low" message to the serial interface once the adaptor's battery check detected low battery.

Standby Level : when the battery voltage, in millivolts, reaches this level the adaptor sends the message "Battery Dead" to the serial interface and goes to long standby.

### 4.3. Battery Check Set

The command to set/reset the battery check period after battery check had been started is: `AT+BCHK=< Batt.chk.freq >`

The valid range for the parameter `Batt.chk.freq` is between 1 and 100. Upon receipt, the adapter records the new value of the battery check frequency. The same command can be used to get the current configured battery check period, the usage as follows  
`AT+BCHK=?`

### 4.4. Battery Check stop

The command to stop checking the battery state is:

`AT+BCHKSTOP`

Upon deployment of this command, battery check is halted.

### 4.5. Battery Value Get

The command to retrieve the results of battery check operation is:

`AT+BATTVALGET`

This command should return a message with the latest value, e.g. "Battery Value: 3.4V" followed by the usual status message.

If this command is issued before issuing the command to start battery checks, it returns "ERROR" or "1", depending on the current verbose setting.