WH-L101-P AT Command Set

This AT Command Set is for WH-L101-P module (Include -L and -H frequency band).

File version: 1.0.0
Content

WH-L101-P AT Command Set ............................................................................................................. 1
1. What is the AT command ............................................................................................................ 3
2. How to use the AT command .................................................................................................... 3
   2.1. How to enter AT command mode ....................................................................................... 3
3. AT command set ....................................................................................................................... 3
4. AT command details ................................................................................................................... 4
   4.1. AT+ENTM ........................................................................................................................... 4
   4.2. AT+E ..................................................................................................................................... 4
   4.3. AT+Z ..................................................................................................................................... 4
   4.4. AT+CFGTF .......................................................................................................................... 4
   4.5. AT+RELD ............................................................................................................................ 5
   4.6. AT+NID ................................................................................................................................ 5
   4.7. AT+VER ............................................................................................................................... 5
   4.8. AT+WMODE ......................................................................................................................... 5
   4.9. AT+UART ............................................................................................................................. 5
   4.10. AT+PMODE ......................................................................................................................... 6
   4.11. AT+ITM ............................................................................................................................... 6
   4.12. AT+WTM ............................................................................................................................ 6
   4.13. AT+SPD ............................................................................................................................... 7
   4.14. AT+ADDR ............................................................................................................................ 7
   4.15. AT+CH .................................................................................................................................. 7
   4.16. AT+FEC ............................................................................................................................... 8
   4.17. AT+PWR ............................................................................................................................. 8
   4.18. AT+RTO .............................................................................................................................. 8
   4.19. AT+SQT ............................................................................................................................. 8
   4.20. AT+KEY ............................................................................................................................ 9
5. Contact ........................................................................................................................................ 9
6. Disclaimer ..................................................................................................................................... 10
7. Update History ............................................................................................................................ 10
1. What is the AT command.

AT command is used for controlling module. You can use AT command to configure and query the settings.

2. How to use the AT command

For USR device is in transparent mode normally, you must enter AT command mode at first. Then you can send AT command to configure or query the settings. After you configure the USR device, you should restart the USR device to make the settings take effect. Every time module restart will work in work mode rather AT command mode. Every AT command must add character carriage return <CR> and line feed <LF>. In Hex, <CR> is 0x0D <LF> is 0x0A.

2.1. How to enter AT command mode

Please read this FAQ about entering AT command mode:

https://www.usriot.com/support/faq/enter-serial-command-mode.html

3. AT command set

<table>
<thead>
<tr>
<th>Number</th>
<th>Command</th>
<th>Function</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td></td>
<td><strong>Basic command</strong></td>
</tr>
<tr>
<td>1</td>
<td>ENTM</td>
<td>Exit AT command mode.</td>
</tr>
<tr>
<td>2</td>
<td>E</td>
<td>Query/Set AT command echo function enable/disable.</td>
</tr>
<tr>
<td>3</td>
<td>Z</td>
<td>Restart LG206.</td>
</tr>
<tr>
<td>4</td>
<td>CFGTF</td>
<td>Save current settings as default settings.</td>
</tr>
<tr>
<td>5</td>
<td>RELD</td>
<td>Reset to default settings.</td>
</tr>
<tr>
<td>6</td>
<td>NID</td>
<td>Query node ID</td>
</tr>
<tr>
<td>7</td>
<td>VER</td>
<td>Query firmware version</td>
</tr>
<tr>
<td>8</td>
<td>WMODE</td>
<td>Query/Set work mode.</td>
</tr>
<tr>
<td>9</td>
<td>UART</td>
<td>Query/Set serial port parameters.</td>
</tr>
<tr>
<td>10</td>
<td>PMODE</td>
<td>Query/Set power consumption mode.</td>
</tr>
<tr>
<td>11</td>
<td>ITM</td>
<td>Query/Set idle time</td>
</tr>
<tr>
<td>12</td>
<td>WTM</td>
<td>Query/Set wake up interval</td>
</tr>
<tr>
<td></td>
<td></td>
<td><strong>LoRa command</strong></td>
</tr>
<tr>
<td>13</td>
<td>SPD</td>
<td>Query/Set rate level</td>
</tr>
<tr>
<td>14</td>
<td>ADDR</td>
<td>Query/Set destination address.</td>
</tr>
<tr>
<td>15</td>
<td>CH</td>
<td>Query/Set channel.</td>
</tr>
<tr>
<td>16</td>
<td>FEC</td>
<td>Query/Set forward error correction enable/disable.</td>
</tr>
</tbody>
</table>
4. AT command details

<table>
<thead>
<tr>
<th>Parameter</th>
<th>Description</th>
<th>Default Value</th>
<th>Range</th>
</tr>
</thead>
<tbody>
<tr>
<td>&lt;Status&gt;</td>
<td>Status of AT command Echo function</td>
<td>ON</td>
<td>ON/OFF</td>
</tr>
</tbody>
</table>

4.1. AT+ENTM

<table>
<thead>
<tr>
<th>Format</th>
<th>Set</th>
<th>AT+ENTM&lt;CR&gt;&lt;LF&gt;</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>Return</td>
<td>&lt;CR&gt;&lt;LF&gt;&lt;CR&gt;&lt;LF&gt;OK&lt;CR&gt;&lt;LF&gt;</td>
</tr>
</tbody>
</table>

4.2. AT+E

<table>
<thead>
<tr>
<th>Parameter</th>
<th>Description</th>
<th>Default Value</th>
<th>Range</th>
</tr>
</thead>
<tbody>
<tr>
<td>&lt;Status&gt;</td>
<td>Status of AT command Echo function</td>
<td>ON</td>
<td>ON/OFF</td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>Format</th>
<th>Query</th>
<th>AT+E&lt;CR&gt;&lt;LF&gt;</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>Return</td>
<td>&lt;CR&gt;&lt;LF&gt;OK=&lt;Status&gt;&lt;CR&gt;&lt;LF&gt;</td>
</tr>
<tr>
<td></td>
<td>Set</td>
<td>AT+E=&lt;Status&gt;&lt;CR&gt;&lt;LF&gt;</td>
</tr>
<tr>
<td></td>
<td>Return</td>
<td>&lt;CR&gt;&lt;LF&gt;&lt;CR&gt;&lt;LF&gt;OK&lt;CR&gt;&lt;LF&gt;</td>
</tr>
</tbody>
</table>

4.3. AT+Z

<table>
<thead>
<tr>
<th>Format</th>
<th>Set</th>
<th>AT+Z&lt;CR&gt;&lt;LF&gt;</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>Return</td>
<td>&lt;CR&gt;&lt;LF&gt;OK&lt;CR&gt;&lt;LF&gt;</td>
</tr>
</tbody>
</table>

4.4. AT+CFGTF

<table>
<thead>
<tr>
<th>Format</th>
<th>Set</th>
<th>AT+CFGTF&lt;CR&gt;&lt;LF&gt;</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>Return</td>
<td>&lt;CR&gt;&lt;LF&gt;+CFGTF:SAVED&lt;CR&gt;&lt;LF&gt;&lt;CR&gt;&lt;LF&gt;OK&lt;CR&gt;&lt;LF&gt;</td>
</tr>
</tbody>
</table>
### 4.5. AT+RELD

<table>
<thead>
<tr>
<th>Format</th>
</tr>
</thead>
<tbody>
<tr>
<td>Set</td>
</tr>
<tr>
<td>Return</td>
</tr>
</tbody>
</table>

### 4.6. AT+NID

<table>
<thead>
<tr>
<th>Parameter</th>
<th>Description</th>
</tr>
</thead>
<tbody>
<tr>
<td>&lt;NID&gt;</td>
<td>4 bytes HEX format character string</td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>Format</th>
</tr>
</thead>
<tbody>
<tr>
<td>Query</td>
</tr>
<tr>
<td>Return</td>
</tr>
</tbody>
</table>

### 4.7. AT+VER

<table>
<thead>
<tr>
<th>Parameter</th>
<th>Description</th>
</tr>
</thead>
<tbody>
<tr>
<td>&lt;VER&gt;</td>
<td>Firmware version</td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>Format</th>
</tr>
</thead>
<tbody>
<tr>
<td>Query</td>
</tr>
<tr>
<td>Return</td>
</tr>
</tbody>
</table>

### 4.8. AT+WMODE

<table>
<thead>
<tr>
<th>Parameter</th>
<th>Description</th>
<th>Default Value</th>
<th>Range</th>
</tr>
</thead>
<tbody>
<tr>
<td>&lt;Mode&gt;</td>
<td>Work mode</td>
<td>TRANS</td>
<td>TRANS: Transparent transmission mode</td>
</tr>
<tr>
<td></td>
<td></td>
<td></td>
<td>FP: Fixed-point transmitting mode</td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>Format</th>
</tr>
</thead>
<tbody>
<tr>
<td>Query</td>
</tr>
<tr>
<td>Return</td>
</tr>
<tr>
<td>Set</td>
</tr>
<tr>
<td>Return</td>
</tr>
</tbody>
</table>

### 4.9. AT+UART

<table>
<thead>
<tr>
<th>Parameter</th>
<th>Description</th>
<th>Default Value</th>
<th>Range</th>
</tr>
</thead>
<tbody>
<tr>
<td>&lt;Baud rate&gt;</td>
<td>Baud rate</td>
<td>115200</td>
<td>1200, 2400, 4800, 9600, 19200, 38400, 57600, 115200</td>
</tr>
<tr>
<td>&lt;Data bits&gt;</td>
<td>Data bits</td>
<td>8</td>
<td>8</td>
</tr>
<tr>
<td>&lt;Stop bits&gt;</td>
<td>Stop bits</td>
<td>1</td>
<td>1, 2</td>
</tr>
<tr>
<td>&lt;Parity&gt;</td>
<td>Parity</td>
<td>NONE</td>
<td>NONE, EVEN, ODD</td>
</tr>
<tr>
<td>&lt;Flow Control&gt;</td>
<td>Flow Control</td>
<td>NFC</td>
<td>NFC: No flow control</td>
</tr>
<tr>
<td></td>
<td></td>
<td></td>
<td>485: Enable RS485</td>
</tr>
</tbody>
</table>
### 4.10. AT+PMODE

<table>
<thead>
<tr>
<th>Parameter</th>
<th>Description</th>
<th>Default Value</th>
<th>Range</th>
</tr>
</thead>
</table>
| <Mode>    | Power consumption mode | RUN | Run: Run mode  
WU: Wake up mode  
LR: Low-power receive mode  
LSR: Low-power transmit/receive mode |

<table>
<thead>
<tr>
<th>Format</th>
</tr>
</thead>
<tbody>
<tr>
<td>Query</td>
</tr>
<tr>
<td>Return</td>
</tr>
<tr>
<td>Set</td>
</tr>
<tr>
<td>Return</td>
</tr>
</tbody>
</table>

### 4.11. AT+ITM

<table>
<thead>
<tr>
<th>Parameter</th>
<th>Description</th>
<th>Default Value</th>
<th>Range</th>
</tr>
</thead>
<tbody>
<tr>
<td>&lt;Time&gt;</td>
<td>In LR/LSR mode, power module and no data transmission during the &lt;Time&gt;, module will enter sleep mode</td>
<td>20s</td>
<td>3~240s</td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>Format</th>
</tr>
</thead>
<tbody>
<tr>
<td>Query</td>
</tr>
<tr>
<td>Return</td>
</tr>
<tr>
<td>Set</td>
</tr>
<tr>
<td>Return</td>
</tr>
</tbody>
</table>

### 4.12. AT+WTM

<table>
<thead>
<tr>
<th>Parameter</th>
<th>Description</th>
<th>Default Value</th>
<th>Range</th>
</tr>
</thead>
<tbody>
<tr>
<td>&lt;Time&gt;</td>
<td>Waking up interval</td>
<td>2000ms</td>
<td>500, 1000, 1500, 2000, 2500, 3000, 3500, 4000ms</td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>Format</th>
</tr>
</thead>
<tbody>
<tr>
<td>Query</td>
</tr>
<tr>
<td>Return</td>
</tr>
<tr>
<td>Set</td>
</tr>
<tr>
<td>Return</td>
</tr>
</tbody>
</table>
Note: This parameter is invalid in RUN, LSR mode. In WU mode, the waking up code that corresponds to waking up interval will be added into data before transmitting data. In LR mode, this parameter is waking up interval after module entering sleep mode.

4.13. AT+SPD

<table>
<thead>
<tr>
<th>Parameter</th>
<th>Description</th>
<th>Default Value</th>
<th>Range</th>
</tr>
</thead>
<tbody>
<tr>
<td>&lt;Class&gt;</td>
<td>LoRa air rate level</td>
<td>10</td>
<td></td>
</tr>
<tr>
<td></td>
<td></td>
<td></td>
<td>1: 268bps</td>
</tr>
<tr>
<td></td>
<td></td>
<td></td>
<td>2: 488bps</td>
</tr>
<tr>
<td></td>
<td></td>
<td></td>
<td>3: 537bps</td>
</tr>
<tr>
<td></td>
<td></td>
<td></td>
<td>4: 878bps</td>
</tr>
<tr>
<td></td>
<td></td>
<td></td>
<td>5: 977bps</td>
</tr>
<tr>
<td></td>
<td></td>
<td></td>
<td>6: 1758bps</td>
</tr>
<tr>
<td></td>
<td></td>
<td></td>
<td>7: 3125bps</td>
</tr>
<tr>
<td></td>
<td></td>
<td></td>
<td>8: 6250bps</td>
</tr>
<tr>
<td></td>
<td></td>
<td></td>
<td>9: 10937bps</td>
</tr>
<tr>
<td></td>
<td></td>
<td></td>
<td>10: 21875bps</td>
</tr>
</tbody>
</table>

Format

Query
AT+SPD<CR><LF>

Return
<CR><LF>+
SPD:<Class><CR><LF><CR><LF>
OK<CR><LF>

Set
AT+SPD=<Class><CR><LF>

Return
<CR><LF><CR><LF>OK<CR><LF>

4.14. AT+ADDR

<table>
<thead>
<tr>
<th>Parameter</th>
<th>Description</th>
<th>Default Value</th>
<th>Range</th>
</tr>
</thead>
<tbody>
<tr>
<td>&lt;Address&gt;</td>
<td>Destination address</td>
<td>0</td>
<td>0~65535</td>
</tr>
</tbody>
</table>

Format

Query
AT+ADDR<CR><LF>

Return
<CR><LF>+ADDR:<Address><CR><LF><CR><LF>OK<CR><LF>

Set
AT+ADDR=<Address><CR><LF>

Return
<CR><LF><CR><LF>OK<CR><LF>

Note: 65535 is broadcast address and all LG206-P with same channel and same rate can receive the data.

4.15. AT+CH

<table>
<thead>
<tr>
<th>Parameter</th>
<th>Description</th>
<th>Range</th>
</tr>
</thead>
<tbody>
<tr>
<td>&lt;Channel&gt;</td>
<td>Channel</td>
<td></td>
</tr>
<tr>
<td></td>
<td>-L: 0~127 (Default is 72, frequency band 470Mhz)</td>
<td></td>
</tr>
<tr>
<td></td>
<td>-H: 0~127 (Default is 65, frequency band 868Mhz)</td>
<td></td>
</tr>
</tbody>
</table>

Format

Query
AT+CH<CR><LF>

Return
<CR><LF>+CH:<Channel><CR><LF><CR><LF>OK<CR><LF>

Set
AT+CH=<Channel><CR><LF>

Return
<CR><LF><CR><LF>OK<CR><LF>
Note: L: Working frequency band=(398+ch)MHz; -H: Working frequency band=(803+ch)MHz

4.16. AT+FEC

<table>
<thead>
<tr>
<th>Parameter</th>
<th>Description</th>
<th>Default Value</th>
<th>Range</th>
</tr>
</thead>
<tbody>
<tr>
<td>&lt;Status&gt;</td>
<td>Status of forward error correction function</td>
<td>OFF</td>
<td>ON/OFF</td>
</tr>
</tbody>
</table>

Format

<table>
<thead>
<tr>
<th>Query</th>
<th>AT+FEC&lt;CR&gt;&lt;LF&gt;</th>
</tr>
</thead>
<tbody>
<tr>
<td>Return</td>
<td>&lt;CR&gt;&lt;LF&gt;+FEC:&lt;Status&gt;&lt;CR&gt;&lt;LF&gt;&lt;LF&gt;OK&lt;CR&gt;&lt;LF&gt;</td>
</tr>
<tr>
<td>Set</td>
<td>AT+FEC=&lt;Status&gt;&lt;CR&gt;&lt;LF&gt;</td>
</tr>
<tr>
<td>Return</td>
<td>&lt;CR&gt;&lt;LF&gt;&lt;CR&gt;&lt;LF&gt;OK&lt;CR&gt;&lt;LF&gt;</td>
</tr>
</tbody>
</table>

Note: Enable this function can make data transmission more stable but lower communication rate.

4.17. AT+PWR

<table>
<thead>
<tr>
<th>Parameter</th>
<th>Description</th>
<th>Default Value</th>
<th>Range</th>
</tr>
</thead>
<tbody>
<tr>
<td>&lt;Status&gt;</td>
<td>Transmitting power</td>
<td>20dbm</td>
<td>10dBm~20dBm</td>
</tr>
</tbody>
</table>

Format

<table>
<thead>
<tr>
<th>Query</th>
<th>AT+PWR&lt;CR&gt;&lt;LF&gt;</th>
</tr>
</thead>
<tbody>
<tr>
<td>Return</td>
<td>&lt;CR&gt;&lt;LF&gt;+PWR:&lt;Status&gt;&lt;CR&gt;&lt;LF&gt;&lt;LF&gt;OK&lt;CR&gt;&lt;LF&gt;</td>
</tr>
<tr>
<td>Set</td>
<td>AT+PWR=&lt;Status&gt;&lt;CR&gt;&lt;LF&gt;</td>
</tr>
<tr>
<td>Return</td>
<td>&lt;CR&gt;&lt;LF&gt;&lt;CR&gt;&lt;LF&gt;OK&lt;CR&gt;&lt;LF&gt;</td>
</tr>
</tbody>
</table>

4.18. AT+RTO

<table>
<thead>
<tr>
<th>Parameter</th>
<th>Description</th>
<th>Default Value</th>
<th>Range</th>
</tr>
</thead>
<tbody>
<tr>
<td>&lt;Time&gt;</td>
<td>Receiving timeout time</td>
<td>500ms</td>
<td>0~15000ms</td>
</tr>
</tbody>
</table>

Format

<table>
<thead>
<tr>
<th>Query</th>
<th>AT+RTO&lt;CR&gt;&lt;LF&gt;</th>
</tr>
</thead>
<tbody>
<tr>
<td>Return</td>
<td>&lt;CR&gt;&lt;LF&gt;+RTO:&lt;Time&gt;&lt;CR&gt;&lt;LF&gt;&lt;LF&gt;OK&lt;CR&gt;&lt;LF&gt;</td>
</tr>
<tr>
<td>Set</td>
<td>AT+RTO=&lt;Time&gt;&lt;CR&gt;&lt;LF&gt;</td>
</tr>
<tr>
<td>Return</td>
<td>&lt;CR&gt;&lt;LF&gt;&lt;CR&gt;&lt;LF&gt;OK&lt;CR&gt;&lt;LF&gt;</td>
</tr>
</tbody>
</table>

Note: This parameter will only take effect in LR/LSR mode and it means the maximum time to enter receive status. In LSR mode, if user configures this parameter to 0, module won’t enable receiving after transmitting data.

4.19. AT+SQT
### Parameter Description Range

<table>
<thead>
<tr>
<th>Parameter</th>
<th>Description</th>
<th>Range</th>
</tr>
</thead>
<tbody>
<tr>
<td>&lt;Time&gt;</td>
<td>Data transmission interval</td>
<td>100~60000ms</td>
</tr>
</tbody>
</table>

**Format**

#### Query

```
AT+SQT<CR><LF>  Display RSSI
```

#### Return

```
ADDR: 0  SNR: 8  RSSI: -15.742600
ADDR: 0  SNR: 8  RSSI: -15.742600
ADDR: 0  SNR: 8  RSSI: -16.809200
ADDR: 0  SNR: 8  RSSI: -16.809200
ADDR: 0  SNR: 8  RSSI: -15.742600
ADDR: 0  SNR: 8  RSSI: -15.742600
```

#### Set

```
AT+SQT=<Time><CR><LF>  Transmit test data automatically
```

#### Return

```
<CR><LF><CR><LF>OK<CR><LF>
```

### 4.20. AT+KEY

**Parameter Description**

<table>
<thead>
<tr>
<th>Parameter</th>
<th>Description</th>
</tr>
</thead>
<tbody>
<tr>
<td>&lt;Key&gt;</td>
<td>16 bytes HEX format character string</td>
</tr>
</tbody>
</table>

**Format**

#### Set

```
AT+KEY=<Key><CR><LF>
```

#### Return

```
<CR><LF><CR><LF>OK<CR><LF>
```

**Note:** To ensure data security, this data encryption word can only be set but not be queried.

---

### 5. Contact

**Company:** Shanghai wenheng electronic technology limited (Wholly-owned subsidiaries of USR group)

**Address:** Floor 11, Building No.1, No.1166, Xinkuo Street, Gaoxin District, Jinan city, Shandong province, 250101
6. Disclaimer

This document provides the information of WH-L101-P products, it hasn't been granted any intellectual property license by forbidding speak or other ways either explicitly or implicitly. Except the duty declared in sales terms and conditions, we don't take any other responsibilities. We don't warrant the products sales and use explicitly or implicitly, including particular purpose merchant-ability and marketability, the tort liability of any other patent right, copyright, intellectual property right. We may modify specification and description at any time without prior notice.

7. Update History

2018-04-11   V1.0.0 created.