USR-GM3/GM3s User Guide

(USR-GM3/GM3s)

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USR-GM3/GM3s is highly-integrated UART to GSM/GPRS module, Users can easily make communication between serial device and cellphone and network device with it. This module is different from the common modules on the market, it is the smallest GPRS DTU, plug-and-play device. USR-GM3s will be with SIM card inside, more easier to use, it just need power supply.
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Quick Start

This chapter is a quick start guide for using USR-GM3/GM3s module. If it is the first time to use USR-GM3/GM3s for you, you should read this chapter carefully, and then follow the tips, try to do some tests by yourself. It will help you to know about USR-GM3/GM3s generally. If you have experience of using USR-GM3/GM3s, please escape this chapter.

In this chapter, you will be told how to make communication between serial device and TCP server. Under default setting, GM3 module works in network transmission mode, it connects to our TCP test server, address is test.usr.cn, port is 2317. The server will respond what it receives.

All the software used in this document can be obtained from our website www.usriot.com. You can also access USR customer support center: http://h.usriot.com.

1.1. Testing environment

The voltage of module is TTL 3.3V, so you should not connect it with computer serial port directly, an adapter is necessary.

NOTE:
1. If it is the first time to use our module for you, please use our EVK(Evaluation Kit), it may save you lot of trouble and time.
2. Keep default setting in this test.
1.2. Transmission

1. Put SIM card into the socket on EVK, connect COM1 to PC’s serial port with cable.

2. Open test software "USR-TCP232-Test", set right serial port number and baud rate, and open it. As the following figure.

3. Power up the EVK with DC 5V adapter, then the POWER led will be on, several seconds later, the WORK led will twinkle, and then GPRS LINKA led will be on.
Meaning of led:

<table>
<thead>
<tr>
<th></th>
<th>Description</th>
</tr>
</thead>
<tbody>
<tr>
<td>POWER</td>
<td>“on” means normal power supply, “off” means power supply failure.</td>
</tr>
<tr>
<td>WORK</td>
<td>“blink” means running correctly, “off” means not running.</td>
</tr>
<tr>
<td>GPRS</td>
<td>“on” means attached, “off” means attach failure.</td>
</tr>
<tr>
<td>LINKA</td>
<td>“on” means socket A has connected to server, “off” means not connect.</td>
</tr>
<tr>
<td>LINKB</td>
<td>“on” means socket B has connected to server, “off” means not connect.</td>
</tr>
<tr>
<td>DATA</td>
<td>“blink” means transmission, “off” means no transmission.</td>
</tr>
</tbody>
</table>

4. Wait for LINKA led on, send data to module via serial port. For example, if you send “www.usr.cn”, at the same time, the DATA led will be on for a while. Then, you will get “www.usr.cn” in the receiving window from our test server.
2. Introduction

2.1. Short Description

USR-GM3/GM3s is new listing at 2015, it is one embedded GSM module. USR-GM3/GM3s is designed for embedded system, it is so small and convenient that you can integrate it to your system easily.

2.2. Characteristic

- Small and completed function GPRS DTU, transmission between serial and GPRS
- Support GSM850/900,DCS1800/1900
- Support GSM/GPRS/EDGE, support 2G/3G/4G SIM card, but based on 2G network
- Support 2 sockets, Support TCP and UDP
- 4KB cache for each of sockets, user can choose to cache data or not
- Support register package and heart beat package
- Support setting parameters via SMS message
- Support 4 work modes: SMS message transmission mode, network transmission mode and HTTPD mode
- Support basic and extend AT command sets
- Support similar RFC2217
- Support flow control: RTS/CTS
- Support RS485

2.3. Features

- Baud rate: 2400, 4800, 9600, 14400, 19200, 28800, 33600, 38400, 57600, 115200, 230400, 460800, 921600.
- Operating voltage: 3.40V~4.20V
- Operating current: average 55mA~80mA, maximum 750mA
- Operating temperature: -25~+85°C
- Storage temperature: -40~+125°C
- Storage humidity: 5%~95%RH
- Max TX power : GSM900 class4(2W), DCS1800 class1(1W)
2.4. Application Field

- In power industry, USR-GM3/GM3s can be embedded in the electric meter, power application terminals and other equipment to realize of reactive power compensation monitoring, distribution monitoring, meter collection and copy, street lamp controlling and other applications, to achieve smart city.

- In Heating field, USR-GM3/GM3s can be embedded in m-BUS concentrator to achieve integration of the concentrator and wireless communication.

- In water industry, USR-GM3/GM3s is also plays a significant role in system of water set copy, water resource management and remote monitoring, wireless communication of water pipe network monitoring.

- In Environmental protection, USR-GM3/GM3s module can be integrated into the on-line monitoring system of flue gas on-line monitoring (CEMS), water quality online monitoring.

- In the field of equipment maintenance (Equipment maintenance field), USR-GM3/GM3s use in the system of equipment remote monitoring, such as elevator monitoring, air conditioning monitoring.

- Other GPRS communication applications.
3. Hardware

3.1. Pin Description

3.1.1. Outside View

3.1.2. Pin Assignment (Top)
3.1.3. PCB Layout
### 3.1.4. Pin Description

Note: ‘P’ for power, ‘I’ for input, ‘O’ for output, ‘N’ for not connect

<table>
<thead>
<tr>
<th>Pin</th>
<th>Name</th>
<th>Type</th>
<th>Description</th>
</tr>
</thead>
<tbody>
<tr>
<td>1</td>
<td>VCC</td>
<td>P</td>
<td>Power supply, 3.4V to 4.2V</td>
</tr>
<tr>
<td>2</td>
<td>VCC</td>
<td>P</td>
<td>Power supply, 3.4V to 4.2V</td>
</tr>
<tr>
<td>3</td>
<td>GND</td>
<td>P</td>
<td>Power ground</td>
</tr>
<tr>
<td>4</td>
<td>GND</td>
<td>P</td>
<td>Power ground</td>
</tr>
<tr>
<td>5</td>
<td>Reload</td>
<td>I</td>
<td>Pull-down 1s restore default setting, &gt;3s restore factory setting</td>
</tr>
<tr>
<td>6</td>
<td>NC</td>
<td>N</td>
<td>Keep no connecting</td>
</tr>
<tr>
<td>7</td>
<td>RS485</td>
<td>O</td>
<td>Control RS485 RX/TX</td>
</tr>
<tr>
<td>8</td>
<td>NC</td>
<td>N</td>
<td>Keep no connecting</td>
</tr>
<tr>
<td>9</td>
<td>Reset</td>
<td>I</td>
<td>Restart, pull-down 1s for restart</td>
</tr>
<tr>
<td>10</td>
<td>GPRS</td>
<td>O</td>
<td>GPRS status, high for attached, low for not attached</td>
</tr>
<tr>
<td>11</td>
<td>LINKA</td>
<td>O</td>
<td>Socket A status, high for connected, low for not connected</td>
</tr>
<tr>
<td>12</td>
<td>LINKB</td>
<td>O</td>
<td>Socket B status, high for connected, low for not connected</td>
</tr>
<tr>
<td>13</td>
<td>DATA</td>
<td>O</td>
<td>Data status, high for transmission, low for not transmission</td>
</tr>
<tr>
<td>14</td>
<td>WORK</td>
<td>O</td>
<td>Running status, high for normal, low for failure</td>
</tr>
<tr>
<td>15</td>
<td>SHUT</td>
<td>I</td>
<td>Shut down, pull-down for shut module</td>
</tr>
<tr>
<td>16</td>
<td>NC</td>
<td>N</td>
<td>Keep no connecting</td>
</tr>
<tr>
<td>17</td>
<td>GND</td>
<td>P</td>
<td>Power ground</td>
</tr>
<tr>
<td>18</td>
<td>SPEAKER-</td>
<td>O</td>
<td>Speaker negative terminal</td>
</tr>
<tr>
<td>19</td>
<td>SPEAKER+</td>
<td>O</td>
<td>Speaker positive terminal</td>
</tr>
<tr>
<td>20</td>
<td>MIC-</td>
<td>I</td>
<td>Microphone negative terminal</td>
</tr>
<tr>
<td>21</td>
<td>MIC+</td>
<td>I</td>
<td>Microphone positive terminal</td>
</tr>
<tr>
<td>22</td>
<td>VSIM</td>
<td>P</td>
<td>Power supply for SIM card</td>
</tr>
<tr>
<td>23</td>
<td>SIM_CLK</td>
<td>O</td>
<td>Clock line for SIM</td>
</tr>
<tr>
<td>24</td>
<td>SIM_DAT</td>
<td>I/O</td>
<td>Data line for SIM</td>
</tr>
<tr>
<td>25</td>
<td>SIM_RST</td>
<td>O</td>
<td>Reset line for SIM</td>
</tr>
<tr>
<td>26</td>
<td>NC</td>
<td>N</td>
<td>Keep no connecting</td>
</tr>
<tr>
<td>27</td>
<td>HST_TXD</td>
<td>O</td>
<td>Upgrade from uart</td>
</tr>
<tr>
<td>28</td>
<td>HST_RXD</td>
<td>I</td>
<td>Upgrade from uart</td>
</tr>
<tr>
<td>29</td>
<td>V_PAD</td>
<td>P</td>
<td>2.8V output</td>
</tr>
<tr>
<td>30</td>
<td>NC</td>
<td>N</td>
<td>Keep no connecting</td>
</tr>
<tr>
<td>31</td>
<td>NC</td>
<td>N</td>
<td>Keep no connecting</td>
</tr>
<tr>
<td>32</td>
<td>NC</td>
<td>N</td>
<td>Keep no connecting</td>
</tr>
<tr>
<td>33</td>
<td>NC</td>
<td>N</td>
<td>Keep no connecting</td>
</tr>
</tbody>
</table>
### 3.1.5. Outside Antenna

1. The line of Antenna should be short to make the insert loss lower and routed as RF line strictly to keep 50ohm matching.

2. It's better to put the antenna pad on the edge of the PCB.

### 3.2. Hardware Block Diagram

The interface module provides includes: power input, output, on/off control, reset to restart control, control, restore the factory Settings, working module, analog audio input, output, UART, SIM, RF antenna.
4. Module Functions

4.1. Work Mode

USR-GM3/GM3s module can work in 3 modes
- SMS message transmission mode
- network transmission mode
- HTTPD mode

4.1.1. Switching Work Mode

Choose by button you want to work mode

And then select save all parameters

Can save the default parameters for the user, click on the restart after effective working mode.
Note: if you can't find the above tool buttons please refer to the picture's position on the drive, you can see the hidden button
4.1.2. Network transmission

4.1.2.1. Description

Under this mode, customer’s serial device can send data to TCP or UDP server via this module, Module can also receive data from server, and transmit the data to customer’s serial device.

Customers don’t need to know the detail of communication, just need some simple setting.

GM3 support 2 sockets, socket A and socket B, they are standalone with each other. GM3 only supports TCP Client and UDP Client.

4.1.2.2. Application Scenarios

If user want to make communication between serial devices and devices on the network, but in the place where serial device stays using router to connect to network is not convenient for user. But signal from base station is available, so GM3 module can build a bridge between serial device and devices on the network.

4.1.2.3. Usage

Note: All the AT commands terminate with carriage return(0x0D), we ignore it here. About how to use AT commands, please refer to chapter 5.

We have one software for customers to use, customers can get it from our website:http://www.usriot.com/Download/248.html.

And we have one software for customers to do serial and network tests, customers can get it from our website:http://www.usriot.com/Product/78.html.
1. Set TCP server software, log in remote server via remote desktop connection.

Then open network test software, set the parameters as the following:

**COM Settings:**
- Port: COM3
- Baud Rate: 115200
- Parity: None
- Data Bits: 8
- Stop Bits: 1

**TCP Server Settings:**
1. Protocol: TCP Server
2. Local host IP: 115.28.232.174
3. Local host port: 10000

**Send Options:**
- Data from file
- Auto Checksum
- Auto Clear Input
- Send as Hex
- Send Recycle
- Interval: 1000 ms
- Load: Clear

**Receive Options:**
- Receive to file
- Add line return
- Receive as HEX
- Receive Pause
- Save: Clear

**Network Data Receive:**
- Ready: Send: 0
- Recv: 0

**Communication Settings:**
- All Connections

**Disconnect:**
- Disconnect
2. Set Module Parameters

1) Set work mode as network transmission

![Network Transmission Diagram]

2) Enable socket A

![Socket A Configuration]

3) Set socket A as TCP client, server address is test.usr.cn(domain), server port is 10000.

![Server Address Configuration]

3. Restart GM3, wait the connection of socket A has been established, send data to module via serial port, then you will get data at network server software. And send data to module via network, then the data will be got at module serial port.
4.1.2.4. Special Type Of Sending Command

Besides under “AT command mode”, customers can also send At commands under network transmission mode via serial or network. This kind of commands is different from common ones, customers should add command password and # at the front of common command string.

Note: every command string should terminate with carriage return. Here we use [0D].
4.1.2.4.1. Serial AT Command

1. Set work mode as network transmission.

   ![Network Transmission Diagram]

   - Choose Work Mode
     - Network Transmission
     - HTTPD Mode
     - SMS Transmission

2. Enable serial command function.

   ![Enable Parameters]

3. Query command password.

   ![Query Parameters]

After setting successful, restart GM3, then send “usr.cn#AT+VER” via serial. Then GM3 will respond the firmware version.
4.1.2.4.2. Network AT command

1. Enable network command function.

2. Query command password.

Besides, customers need to configure socket A or socket B for network connection, refer to
chapter 4.1.2.3. After setting successful, restart GM3. When connection is establishing, send “usr.cn#AT+VER” from network.
4.1.3. HTTPD Function

4.1.3.1. Description

Under this mode, customer’s serial device can request data from HTTP server via this module, Module can also receive data from HTTP server, analysis the data and transmit the data to customer’s serial device.

Customers don’t need to know the detail of communication, just need some simple setting.

4.1.3.2. Application Scenarios

If customer want to request data from HTTP server, and customer’s serial device can’t connect to Internet via a router. But signal from base station is available, so customer can use GM3 module to make this communication. Customer just need to do some simple setting, and send request data. GM3 could get the result from HTTP server, and analysis it to get the useful data, send the data to serial device.

4.1.3.3. Usage

Note: All the AT commands terminate with carriage return (0x0D), we ignore it here. About how to use AT commands, please refer to chapter 5.

We have one software for customers to use, customers can get it from our website: http://www.usriot.com/Download/248.html.

And we have one software for customers to do serial and network tests, customers can get
it from our website: `http://www.usriot.com/Product/78.html`.

1. Setting

1) Set work mode as HTTPD.

2) Set request type as GET.

3) Set the address of HTTP server as "www.usr.cn", and set server port as 80.

4) Set the request URL as "/1.php?"

5) Set request head string.

"Accept:text/html[0D][0A]Accept-Language:zh-CN[0D][0A]User-Agent: Mozilla/5.0[0D][0A]Connection: Keep-Alive[0D][0A]"

NOTE:
[0D] means carriage return, it is 0x0D in hex number. [0A] means line feed, it is 0x0A in hex number. Because this kind of data is not able to be put into AT commands string, so it is tropical. The rule is two bytes in [] means one byte in hex form. For example,
“[0D]” means carriage return, 0x0D in hex number.
“[20]” means space, 0x20 in hex number.

2. Restart module, then send “data=www.usr.cn” to HTTP server via serial port, you will get [www.usr.cn] from server.

NOTE: the server “www.usr.cn” is USR’s HTTP test server, if you send “data=www.usr.cn” to it, it will feed back the data after “=” with “[]” including.

In the step 1, serial device send “data=www.usr.cn” to GM3, then GM3 prepares HTTP package with head information set before, so the package data is:
GET /1.php?data=www.usr.cn HTTP/1.1
Host: www.usr.cn
Accept:text/html
Accept-Language:zh-CN
User-Agent: Mozilla/5.0
Connection: Keep-Alive

After sending data, GM3 receives data:
HTTP/1.1 200 OK
Date: Wed, 24 Jun 2015 04:08:35 GMT
Server: Apache/2.0.63 (Win32) mod_ssl/2.0.65 OpenSSL/0.9.8o PHP/5.2.14
X-Powered-By: PHP/5.2.14
Cache-Control: max-age=600
Expires: Wed, 24 Jun 2015 04:18:35 GMT
Content-Length: 19
Keep-Alive: timeout=15, max=99
Connection: Keep-Alive
Content-Type: text/html

[www.usr.cn]
After GM3 receives the above data, it will analysis the information, and send the result to serial device.
4.1.4. SMS Message Transmission

4.1.4.1. Description

Under this mode, customer’s serial device can send SMS message to a cell phone via this module, Module can also receive SMS message from cell phone, and transmit the message in serial data to customer’s serial device.

Customers don’t need to know the detail of communication, just need some simple setting.

4.1.4.2. Application Scenarios

If user’s device is a serial device, it is placed at remote area. User wants to communicate with this device by SMS message, to check what status the device is in, or to control the device.

4.1.4.3. Usage

Note: All the AT commands terminate with carriage return(0x0D), we ignore it here. About how to use AT commands, please refer to chapter 5.

We have one software for customers to use, customers can get it from our website: [http://www.usriot.com/Download/248.html](http://www.usriot.com/Download/248.html).

And we have one software for customers to do serial and network tests, customers can get it from our website: [http://www.usriot.com/Product/78.html](http://www.usriot.com/Product/78.html).
1. Setting

1) Set the destination phone number.

```
Station phone number 10086:0010
```

2) Set work mode as SMS message transmission.

2. Reset module, and send message to module via serial port, then you will get the message on your cellphone. Then send a message back to module, then you will get the message from module's serial port.
2. 
www.usr.cn

3. 济南有人物联网技术有限公司
4.1.4.4. **SMS AT Command**

Note: every command string should terminate with carriage return. Here we use [0D].

1. Query command password.

Besides, customers need to configure SMS message transmission, refer to chapter 4.1.4.3. After setting successful, restart GM3. send “usr.cn#AT+VER” to GM3 from cellphone, then then you will get response from GM3.
4.2. Register Package

4.2.1. Description

Under network transmission mode, customers can send Register Package. Register Package is used to make server know what device is sending data, or as a password. Customers can choose to send register package to network server, or serial device. Register Package could be sent when network connection is established, or as the head of every TCP/UDP package. The type of register package could be ICCID, IMEI, or user-defined data.

4.2.2. Usage

1. Enable sending register package.

2. Set the type of register package data. For instance, using user-defined data.

3. Set user-defined register data, for instance, set data as string “www.usr.cn”, you need to convert it to hex string “777772E7573722E636E”.

4. Set sending type, for instance, send data when connection is established.

```
<table>
<thead>
<tr>
<th>Enable register package</th>
<th>Reg package send type</th>
<th>Reg package data type</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>Send register data when socket c</td>
<td>User-de 77777217573722B</td>
</tr>
</tbody>
</table>
```

Besides, customers need to configure socket A or socket B for network connection, refer to chapter 4.1.2.3. After setting successful, restart GM3. When connection is establishing, GM3 will send string “www.usr.cn” to server via socket A and socket B.
4.3. Heart Beat Package

4.3.1. Description

Under network transmission mode, customers can send Heart Beat Package to network server or serial device. Sending heart beat data to network server, is used to check if connection is alive. If GM3 sends data unsuccessful for 3 times, it will try to reconnect to server. Sending heart beat data to serial device, is usually used to query information from serial device instead of sending query command from server, To do this can cut some communication flow.

4.3.2. Usage

1. Enable sending heart beat package.

2. Set the destination of heart beat package data. for instance, to network server.

3. Set heart beat data, for instance, set data as string “www.usr.cn”, customer need to convert it to hex string “777772E7573722E636E”.

4. Set sending period, for instance, 30 seconds.
Besides, customers need to configure socket A or socket B for network connection, refer to chapter 4.1.2.3. After setting successful, restart GM3. When connection is establishing, If device is idle for 30 seconds, GM3 will send string “www.usr.cn” to server via socket A and socket B.

4.4. UART

4.4.1. RS485

4.4.1.1. Description

GM3 module supports RS485 function. RS485 is half duplex, the direction of transmitting data should be controlled manually. If customer enables module’s RS485 function, the pin 7 of module is used to control the direction of communication. Refer to command AT+UART
4.4.1.2. RS485 Reference Circuit

4.4.2. Similar RFC2217

4.4.2.1. Description

This function is similar to RFC2217. Customer can change the parameters of serial port dynamically via network. This modification is temporary, when module restarts, the parameters changed will return back to previous values.

4.4.2.2. Definition of similar RFC2217

This protocol contains 8 bytes, details as the following form
5. Parameters Setting

Sending AT commands is the only way to set the parameters of GM3 module. There are two kinds of commands, basic AT commands and extended AT commands.
Basic AT commands are used to setting the running parameters of GM3 under SMS message transmission, network transmission and HTTPD modes.

Extended AT commands are used to design new functions by customers. About how to use extended AT command, please refer to “GM3 extended AT commands User Guide”.

5.1. Operating AT command

When GM3 works in one of the three modes: SMS message transmission, network transmission or HTTPD mode. You can get module into “command mode” by sending specific timing data to it, then send commands to change module’s running parameters. If changing is done, get module back to previous work mode.

In the above figure, abscissa axis means time, the data above time axis is sent to module from device, and the data bellow time axis is sent to device from module.

**Time requirement:**
- T1 > 200ms
- T2 < 50ms
- T3 < 50ms
- T5 < 3s

**Go into command mode:**

1. Module is in SMS message transmission, network transmission or HTTPD mode.

2. Device send “+++” to module, then module send ‘a’ to device.
3. If device receives ‘a’, it must send ‘a’ to module within 3 seconds.

4. Module receives ‘a’, and sends “+ok” to device.

5. Device receives “+ok”, it means module has gone to temporary command mode, so device can send AT commands to module.

**Back to previous mode:**

1. Device send command “AT+ENTM” to module.

2. Module receives “AT+ENTM”, and send “OK” to device.

3. Device receives “OK”, it means module has gone back to previous mode.

### 5.2. AT Command Format

AT commands work in asking-answering mode, “asking” means device sends commands to module, “answering” means module responds to device.

**Symbol Description:**

<table>
<thead>
<tr>
<th>Symbol</th>
<th>Description</th>
</tr>
</thead>
<tbody>
<tr>
<td>&lt;&gt;</td>
<td>content inside is necessary.</td>
</tr>
<tr>
<td>[]</td>
<td>content inside is not necessary.</td>
</tr>
<tr>
<td>{}</td>
<td>range, for example, A~B means the range is from A to B.</td>
</tr>
<tr>
<td>~</td>
<td>carriage return, hex number is 0D.</td>
</tr>
<tr>
<td>CMD</td>
<td>command code</td>
</tr>
<tr>
<td>OP</td>
<td>operator</td>
</tr>
<tr>
<td>PARA</td>
<td>parameter</td>
</tr>
<tr>
<td>CR</td>
<td>carriage return</td>
</tr>
<tr>
<td>LF</td>
<td>line feed</td>
</tr>
</tbody>
</table>

1) **The format of asking**

Command string: `<AT+>[CMD][OP][PARA]<CR>`
<table>
<thead>
<tr>
<th>Code</th>
<th>meaning</th>
<th>necessary</th>
</tr>
</thead>
<tbody>
<tr>
<td>AT+</td>
<td>AT command head</td>
<td>Yes</td>
</tr>
<tr>
<td>CMD</td>
<td>purpose of command</td>
<td>Yes</td>
</tr>
<tr>
<td>OP</td>
<td>action type of command</td>
<td>No</td>
</tr>
<tr>
<td>PARA</td>
<td>parameters of command</td>
<td>No</td>
</tr>
<tr>
<td>CR</td>
<td>termination of command</td>
<td>Yes</td>
</tr>
</tbody>
</table>

**Type of command**

<table>
<thead>
<tr>
<th>type</th>
<th>Command string</th>
<th>description</th>
</tr>
</thead>
<tbody>
<tr>
<td>0</td>
<td>AT+(CMD)?{CR}</td>
<td>query parameters</td>
</tr>
<tr>
<td>1</td>
<td>AT+(CMD)=?{CR}</td>
<td>Query the value of parameter</td>
</tr>
<tr>
<td>2</td>
<td>AT+(CMD){CR}</td>
<td>execute action or query parameters</td>
</tr>
<tr>
<td>3</td>
<td>AT+(CMD)= {PARAM}{CR}</td>
<td>Set the value of parameter</td>
</tr>
</tbody>
</table>

2) **The format of answering**

There are two kinds of response, with or without echo. All the followings are using without echo as examples.

Command string: `[CR][LF][+CMD][OP][PARA][CR][LF]<CR><LF>[OK]<CR><LF>`

<table>
<thead>
<tr>
<th>Code</th>
<th>meaning</th>
<th>necessary</th>
</tr>
</thead>
<tbody>
<tr>
<td>CR</td>
<td>carriage return</td>
<td>No</td>
</tr>
<tr>
<td>LF</td>
<td>line feed</td>
<td>No</td>
</tr>
<tr>
<td>+CMD</td>
<td>response head</td>
<td>No</td>
</tr>
<tr>
<td>OP</td>
<td>operator</td>
<td>No</td>
</tr>
<tr>
<td>PARA</td>
<td>parameter</td>
<td>No</td>
</tr>
<tr>
<td>CR</td>
<td>carriage return</td>
<td>No</td>
</tr>
<tr>
<td>LF</td>
<td>line feed</td>
<td>No</td>
</tr>
<tr>
<td>CR</td>
<td>carriage return</td>
<td>Yes</td>
</tr>
<tr>
<td>LF</td>
<td>line feed</td>
<td>Yes</td>
</tr>
<tr>
<td>OK</td>
<td>operating successful</td>
<td>No</td>
</tr>
<tr>
<td>CR</td>
<td>carriage return</td>
<td>Yes</td>
</tr>
<tr>
<td>LF</td>
<td>line feed</td>
<td>Yes</td>
</tr>
</tbody>
</table>

**Type of command**

<table>
<thead>
<tr>
<th>type</th>
<th>Command string</th>
<th>description</th>
</tr>
</thead>
<tbody>
<tr>
<td>0</td>
<td>&lt;CR&gt;&lt;LF&gt;&lt;OK&gt;&lt;CR&gt;&lt;LF&gt;</td>
<td>successful</td>
</tr>
<tr>
<td>1</td>
<td>&lt;CR&gt;&lt;LF&gt;&lt;+CMD&gt;&lt;PARA&gt;&lt;CR&gt;&lt;LF&gt;&lt;CR&gt;&lt;LF&gt;&lt;OK&gt;&lt;CR&gt;&lt;LF&gt;</td>
<td>return parameter</td>
</tr>
</tbody>
</table>
5.3. AT Command Set

<table>
<thead>
<tr>
<th>NO.</th>
<th>command</th>
<th>description</th>
</tr>
</thead>
<tbody>
<tr>
<td>1</td>
<td>H</td>
<td>help message</td>
</tr>
<tr>
<td>2</td>
<td>Z</td>
<td>restart</td>
</tr>
<tr>
<td>3</td>
<td>E</td>
<td>query and set enable/disable echo</td>
</tr>
<tr>
<td>4</td>
<td>ENTM</td>
<td>quit from command mode</td>
</tr>
<tr>
<td>5</td>
<td>WKMOD</td>
<td>query or set work mode</td>
</tr>
<tr>
<td>6</td>
<td>CALEN</td>
<td>query or set if allow to call</td>
</tr>
<tr>
<td>7</td>
<td>NATEN</td>
<td>query or set enable/disable network command</td>
</tr>
<tr>
<td>8</td>
<td>UATEN</td>
<td>query or set enable/disable serial port command</td>
</tr>
<tr>
<td>9</td>
<td>CMDPW</td>
<td>query or set command password</td>
</tr>
<tr>
<td>10</td>
<td>CACHEN</td>
<td>query or set enable/disable data cache</td>
</tr>
<tr>
<td>11</td>
<td>STMSG</td>
<td>query or set welcome message</td>
</tr>
<tr>
<td></td>
<td></td>
<td><strong>Management commands</strong></td>
</tr>
<tr>
<td>12</td>
<td>S</td>
<td>Save current settings</td>
</tr>
<tr>
<td>13</td>
<td>RELD</td>
<td>restore default settings</td>
</tr>
<tr>
<td>14</td>
<td>CLEAR</td>
<td>restore factory settings</td>
</tr>
<tr>
<td>15</td>
<td>CFGTF</td>
<td>save current setting as default setting</td>
</tr>
<tr>
<td></td>
<td></td>
<td><strong>Configuration commands</strong></td>
</tr>
<tr>
<td>16</td>
<td>VER</td>
<td>query firmware version</td>
</tr>
<tr>
<td>17</td>
<td>SN</td>
<td>query SN code</td>
</tr>
<tr>
<td>18</td>
<td>ICCID</td>
<td>query CCID code</td>
</tr>
<tr>
<td>19</td>
<td>IMEI</td>
<td>query IMEI code</td>
</tr>
<tr>
<td>20</td>
<td>CNUM</td>
<td>query the MS ISDN related to the subscriber</td>
</tr>
<tr>
<td></td>
<td></td>
<td><strong>Query information commands</strong></td>
</tr>
<tr>
<td>21</td>
<td>UART</td>
<td>query or set serial port parameters</td>
</tr>
<tr>
<td>22</td>
<td>RFCEN</td>
<td>query or set enable/disable similar RFC2117</td>
</tr>
<tr>
<td></td>
<td></td>
<td><strong>UART parameters commands</strong></td>
</tr>
<tr>
<td>23</td>
<td>APN</td>
<td>query or set APN code</td>
</tr>
<tr>
<td>24</td>
<td>SOCKA</td>
<td>query or set socket A parameters</td>
</tr>
<tr>
<td>25</td>
<td>SOCKB</td>
<td>query or set socket B parameters</td>
</tr>
<tr>
<td>26</td>
<td>SOCKAEN</td>
<td>query or set enable/disable socket A</td>
</tr>
<tr>
<td>27</td>
<td>SOCKBEN</td>
<td>query or set enable/disable socket B</td>
</tr>
<tr>
<td>28</td>
<td>SOCKASL</td>
<td>query or set socket A long or short connection</td>
</tr>
<tr>
<td>29</td>
<td>SOCKBSL</td>
<td>query or set socket B long or short connection</td>
</tr>
<tr>
<td>30</td>
<td>SOCKALK</td>
<td>query socket A connection status</td>
</tr>
<tr>
<td>31</td>
<td>SOCKBLK</td>
<td>query socket B connection status</td>
</tr>
<tr>
<td></td>
<td></td>
<td><strong>Socket parameters commands</strong></td>
</tr>
</tbody>
</table>
### Register package parameters commands

<table>
<thead>
<tr>
<th>Command</th>
<th>Description</th>
</tr>
</thead>
<tbody>
<tr>
<td>32</td>
<td>REGEN</td>
</tr>
<tr>
<td>33</td>
<td>REGTP</td>
</tr>
<tr>
<td>34</td>
<td>REGID</td>
</tr>
<tr>
<td>35</td>
<td>REGDT</td>
</tr>
<tr>
<td>36</td>
<td>REGSND</td>
</tr>
</tbody>
</table>

### Heartbeat package parameters commands

<table>
<thead>
<tr>
<th>Command</th>
<th>Description</th>
</tr>
</thead>
<tbody>
<tr>
<td>37</td>
<td>HEARTEN</td>
</tr>
<tr>
<td>38</td>
<td>HEARTDT</td>
</tr>
<tr>
<td>39</td>
<td>HEARTTP</td>
</tr>
<tr>
<td>40</td>
<td>HEARTTM</td>
</tr>
</tbody>
</table>

### HTTPD parameters commands

<table>
<thead>
<tr>
<th>Command</th>
<th>Description</th>
</tr>
</thead>
<tbody>
<tr>
<td>41</td>
<td>HTPTP</td>
</tr>
<tr>
<td>42</td>
<td>HTTPURL</td>
</tr>
<tr>
<td>43</td>
<td>HTTPSV</td>
</tr>
<tr>
<td>44</td>
<td>HTPHD</td>
</tr>
</tbody>
</table>

### SMS message parameters commands

<table>
<thead>
<tr>
<th>Command</th>
<th>Description</th>
</tr>
</thead>
<tbody>
<tr>
<td>45</td>
<td>DSTNUM</td>
</tr>
<tr>
<td>46</td>
<td>SMSEND</td>
</tr>
</tbody>
</table>

1) **AT+H**
   - function: help message.
   - format:
     - query:
       ```
       AT+H{CR}
       {CR}{LF}help message{CR}{LF}{CR}{LF}OK{CR}{LF}
       ```
     - parameter:
       - help message: commands introduction.

2) **AT+Z**
   - function: restart.
   - format:
     ```
     AT+Z{CR}
     {CR}{LF}OK{CR}{LF}
     ```

3) **AT+E**
   - function: query and set enable/disable echo.
   - format:
     - Query parameter introductions:
4) AT+ENTM
   - function: quit from command mode.
   - format:
     - query current value of parameter:
       AT+E={CR}
       {CR}(LF)+E:<"on","off">{CR}{LF}{CR}{LF}OK{CR}{LF}
   - set parameter:
       AT+ENTM={CR}
       {CR}{LF}OK{CR}{LF}

5) AT+WKMOD
   - function: query or set work mode.
   - format:
     - query parameter introductions:
       AT+WKMOD=<{CR}
       {CR}(LF)+WKMOD:<"CMD","SMS","NET","HTTPD">{CR}{LF}{CR}{LF}OK{CR}{LF}
     - query current value of parameter:
       AT+WKMOD={CR} or AT+WKMOD?={CR}
       {CR}(LF)+WKMOD:mode={CR}{LF}{CR}{LF}OK{CR}{LF}
   - set parameter:
       AT+WKMOD=mode={CR}
       {CR}{LF}OK{CR}{LF}

6) AT+CALEN
function: query or set if allow to call.

format:
- query parameter introductions:
  `AT+CALEN=?{CR}
  {CR}{LF}+CALEN:<"on","off">{CR}{LF}{CR}{LF}OK{CR}{LF}
- query current value of parameter:
  `AT+CALEN{CR} or AT+CALEN{CR}
  {CR}{LF}+CALEN:status{CR}{LF}{CR}{LF}OK{CR}{LF}
- set parameter:
  `AT+CALEN=status{CR}
  {CR}{LF}OK{CR}{LF}

7) AT+NATEN

function: query or set enable/disable network command.

format:
- query parameter introductions:
  `AT+NATEN=?{CR}
  {CR}{LF}+NATEN:<"on","off">{CR}{LF}{CR}{LF}OK{CR}{LF}
- query current value of parameter:
  `AT+NATEN{CR} or AT+NATEN{CR}
  {CR}{LF}+NATEN:status{CR}{LF}{CR}{LF}OK{CR}{LF}
- set parameter:
  `AT+NATEN=status{CR}
  {CR}{LF}OK{CR}{LF}

parameter:
- status: enable or disable network command
  - “on”: enable
  - “off”: disable

8) AT+UATEN

function: query or set enable/disable serial port command

format:
- query parameter introductions:
  `AT+UATEN=?{CR}
  {CR}{LF}+UATEN:<"on","off">{CR}{LF}{CR}{LF}OK{CR}{LF}
- query current value of parameter:
  `AT+UATEN{CR} or AT+UATEN{CR}
  {CR}{LF}+UATEN:status{CR}{LF}{CR}{LF}OK{CR}{LF}`
◆ set parameter:
  AT+UATEN=status{CR}
  {CR}{LF}OK{CR}{LF}
  parameter :
  ◆ status : enable or disable serial port command.
     ● “on” : enable
     ● “off” : disable

9) AT+CMDPW
  function : query or set command password
  format :
  ◆ query parameter introductions:
    AT+CMDPW=?{CR}
    {CR}{LF}+CMDPW:<"password">{CR}{LF}{CR}{LF}OK{CR}{LF}
  ◆ query current value of parameter:
    AT+CMDPW{CR} or AT+CMDPW?{CR}
    {CR}{LF}+CMDPW:password{CR}{LF}{CR}{LF}OK{CR}{LF}
  ◆ set parameter:
    AT+CMDPW=password{CR}
    {CR}{LF}OK{CR}{LF}
  parameter :
  ◆ password : command password

10) AT+CACHEN
  function : query or set enable/disable data cache.
  format :
  ◆ query parameter introductions:
    AT+CACHEN=?{CR}
    {CR}{LF}+CACHEN:<"on","off">{CR}{LF}{CR}{LF}OK{CR}{LF}
  ◆ query current value of parameter:
    AT+CACHEN{CR} or AT+CACHEN?{CR}
    {CR}{LF}+CACHEN:status{CR}{LF}{CR}{LF}OK{CR}{LF}
  ◆ set parameter:
    AT+CACHEN=status{CR}
    {CR}{LF}OK{CR}{LF}
  parameter :
  ◆ status : enable/disable data cache.
     ● “on” : enable
     ● “off” : disable

11) AT+STMSG
function: query or set welcome message.

format:
  ◆ query parameter introductions:

AT+STMSG=?{CR}  
{CR}{LF}+STMSG:<"welcome message">{CR}{LF}{CR}{LF}OK{CR}{LF}

◆ query current value of parameter:

AT+STMSG(CR) or AT+STMSG?{CR} 
{CR}{LF}+STMSG:message(CR){LF}{CR}{LF}{LF}OK{CR}{LF}

◆ set parameter:

AT+STMSG=message{CR}  
{CR}{LF}OK{CR}{LF}

parameter:
  ◆ message: welcome message, when module powers up, it will show them, this can be used to check if module starts up normally.

12) AT+S
   function: save current settings.
   format:
   ◆ setting:

AT+S{CR}  
{CR}{LF}OK{CR}{LF}

13) AT+RELD
   function: restore default settings.
   format:
   ◆ setting:

AT+RELD{CR}  
{CR}{LF}OK{CR}{LF}

14) AT+CLEAR
   function: restore factory settings.
   format:
   ◆ setting:

AT+CLEAR{CR}  
{CR}{LF}OK{CR}{LF}

15) AT+CFGTF
   function: save current setting as default setting.
   format:
   ◆ setting:
AT+CFGTF{CR}
{CR}{LF}OK{CR}{LF}

16) AT+VER
   function : query version.
   format :
   ◆ query current value of parameter:
       AT+VER{CR} or AT+VER?{CR}
       {CR}{LF}+VER:version{CR}{LF}{CR}{LF}OK{CR}{LF}
   parameter :
   ◆ version : firmware version

17) AT+SN
   function : query SN code.
   format :
   ◆ query current value of parameter:
       AT+SN{CR} or AT+SN?{CR}
       {CR}{LF}+SN:code{CR}{LF}{CR}{LF}OK{CR}{LF}
   parameter :
   ◆ code : SN code

18) AT+ICCID
   function : query ICCID code.
   format :
   ◆ query current value of parameter:
       AT+ICCID{CR} or AT+ICCID?{CR}
       {CR}{LF}+ICCID:code{CR}{LF}{CR}{LF}OK{CR}{LF}
   parameter :
   ◆ code : ICCID code

19) AT+IMEI
   function : query IMEI code.
   format :
   ◆ query current value of parameter:
       AT+IMEI{CR} or AT+IMEI?{CR}
       {CR}{LF}+IMEI:code{CR}{LF}{CR}{LF}OK{CR}{LF}
   parameter :
   ◆ code : IMEI code

20) AT+CNUM
function: query the MS ISDN related to the subscriber.

- query current value of parameter:
  \{AT+CNUM\{CR\}
  {CR\{LF\}CNUM:phone number\{CR\}\{LF\}OK\{CR\}\{LF\}

- parameter:
  - phone number: phone number

21) AT+UART

- function: query or set serial port parameters.

- format:
  - query parameter introductions:
    \{AT+UART=?\{CR\}
    \{CR\}LF\{AT+UART:-<2400,4800,9600,14400,19200,28800,33600,38400,57600,115200,
    230400,460800,921600>,<"NONE","O DD","EVEN">,<7,8>,<1,2>,<"NONE","C RTS",
    "RS48 5">\{CR\}\{LF\}\{CR\}\{LF\}OK\{CR\}\{LF\}
  - query current value of parameter:
    \{AT+UART\{CR\}
    \{CR\}LF\{AT+UART:baud,parity,data bit,stop bit,flow control\{CR\}\{LF\}\{CR\}\{LF\}OK\{CR\}\{LF\}
  - set parameter:
    \{AT+UART=baud,parity,data bit,stop bit,flow control\{CR\}
    \{CR\}LF\{OK\{CR\}\{LF\}

- parameter:
  - baud: baud rate
    2400,4800,9600,14400,19200,28800,33600,38400,57600,115200,230400,460800,921600
  - parity:
    - “NONE”: no parity
    - “OD D”: odd parity
    - “EVEN”: even parity
  - data bit:
    - 7: 7 data bits
    - 8: 8 data bits
  - flow control:
    - “NONE”: no flow control
    - “C RTS”: use RTS/CTS for flow control
    - “RS48 5”: use RS485 function

22) AT+RFCEN

- function: query or set enable/disable similar RFC2117.

- format:
23) **AT+APN**
   - function: query or set APN code.
   - format:
     - query parameter introductions:
       
       ```
       AT+APN=?{CR}
       {CR}{LF}+APN:"code">{CR}{LF}{CR}{LF}OK{CR}{LF}
       ```
     - query current value of parameter:
       
       ```
       AT+APN{CR} or AT+APN?{CR}
       {CR}{LF}+APN:code{CR}{LF}{CR}{LF}OK{CR}{LF}
       ```
     - set parameter:
       
       ```
       AT+APN=code{CR}
       {CR}{LF}OK{CR}{LF}
       ```
   - parameter:
     - `code`: APN code

24) **AT+SOCKA**
   - function: query or set socket A parameters.
   - format:
     - query parameter introductions:
       
       ```
       AT+SOCKA=?{CR}
       {CR}{LF}+SOCKA:"TCP","UDP",<"address">,<port>{CR}{LF}{CR}{LF}OK{CR}{LF}
       ```
     - query current value of parameter:
       
       ```
       AT+SOCKA{CR} or AT+SOCKA?{CR}
       {CR}{LF}+SOCKA:protocol,address,port{CR}{LF}{CR}{LF}OK{CR}{LF}
       ```
     - set parameter:
       
       ```
       AT+SOCKA=protocol,address,port{CR}
       {CR}{LF}OK{CR}{LF}
       ```
- **parameter**:  
  - protocol: communication protocol  
    - "TCP": TCP  
    - "UDP": UDP  
  - address: server address, IP or domain name  
  - port: server port, 1~65535

25) **AT+SOCKB**  
- function: query or set socket B parameters.  
- format:  
  - query parameter introductions:  
    ```  
    AT+SOCKB=?{CR}  
    {CR}{LF}+SOCKB:"TCP","UDP",<"address">,<port>{CR}{LF}{CR}{LF}OK{CR}{LF}  
    ```  
  - query current value of parameter:  
    ```  
    AT+SOCKB{CR} or AT+SOCKB?{CR}  
    {CR}{LF}+SOCKB:protocol,address,port{CR}{LF}{CR}{LF}OK{CR}{LF}  
    ```  
  - set parameter:  
    ```  
    AT+SOCKB=protocol,address,port{CR}  
    {CR}{LF}OK{CR}{LF}  
    ```  
- parameter:  
  - protocol: communication protocol  
    - "TCP": TCP  
    - "UDP": UDP  
  - address: server address, IP or domain name  
  - port: server port, 1~65535

26) **AT+SOCKAEN**  
- function: query or set enable/disable socket A.  
- format:  
  - query parameter introductions:  
    ```  
    AT+SOCKAEN=?{CR}  
    {CR}{LF}+SOCKAEN:"on","off">{CR}{LF}{CR}{LF}OK{CR}{LF}  
    ```  
  - query current value of parameter:  
    ```  
    AT+SOCKAEN{CR} or AT+SOCKAEN?{CR}  
    {CR}{LF}+SOCKAEN:status{CR}{LF}{CR}{LF}OK{CR}{LF}  
    ```  
  - set parameter:  
    ```  
    AT+SOCKAEN=status{CR}  
    {CR}{LF}OK{CR}{LF}  
    ```  
- parameter:  
  - status: enable or disable socket A  
    - "on": enable
27) AT+SOCKBN
   ➢ function: query or set enable/disable socket B.
   ➢ format:
      ◆ query parameter introductions:
         AT+SOCKBN=?{CR}
         {CR}{LF}+SOCKBN:="on","off">{CR}{LF}{CR}{LF}OK{CR}{LF}
      ◆ query current value of parameter:
         AT+SOCKBN{CR} or AT+SOCKBN?{CR}
         {CR}{LF}+SOCKBN:status{CR}{LF}{CR}{LF}OK{CR}{LF}
      ◆ set parameter:
         AT+SOCKBN=status{CR}
         {CR}{LF}OK{CR}{LF}
   ➢ parameter:
      ◆ status: enable or disable socket B.
         ● “on”: enable
         ● “off”: disable

28) AT+SOCKASL
   ➢ function: query or set socket A long or short connection.
   ➢ format:
      ◆ query parameter introductions:
         AT+SOCKASL=?{CR}
         {CR}{LF}+SOCKASL:="short","long">{CR}{LF}{CR}{LF}OK{CR}{LF}
      ◆ query current value of parameter:
         AT+SOCKASL{CR} or AT+SOCKASL?{CR}
         {CR}{LF}+SOCKASL:type{CR}{LF}{CR}{LF}OK{CR}{LF}
      ◆ set parameter:
         AT+SOCKASL?type{CR}
         {CR}{LF}OK{CR}{LF}
   ➢ parameter:
      ◆ type: connection style
         ● “short”: short connection
         ● “long”: long connection

29) AT+SOCKBSL
   ➢ function: query or set socket B long or short connection.
   ➢ format:
      ◆ query parameter introductions:
         AT+SOCKBSL=?{CR}
AT+SOCKBSDL:<"short","long">{CR}{LF}{CR}{LF}OK{CR}{LF}

- query current value of parameter:
  AT+SOCKBSDL{CR} or AT+SOCKBSDL{CR}
  {CR}{LF}+SOCKBSDL:type{CR}{LF}{CR}{LF}OK{CR}{LF}
- set parameter:
  AT+SOCKBSDL:type{CR}
  {CR}{LF}OK{CR}{LF}

  parameter:
  - type: connection style
    - "short": short connection
    - "long": long connection

30) AT+SOCKALK

- function: query socket A connection status.
- format:
  - query current value of parameter:
    AT+SOCKALK{CR} or AT+SOCKALK{CR}
    {CR}{LF}+SOCKALK:status{CR}{LF}{CR}{LF}OK{CR}{LF}
  - parameter:
    - status: socket A connection status.
      - "connected": connected
      - "disconnected": disconnected

31) AT+SOCKBLK

- function: query socket B connection status.
- format:
  - query current value of parameter:
    AT+SOCKBLK{CR} or AT+SOCKBLK{CR}
    {CR}{LF}+SOCKBLK:status{CR}{LF}{CR}{LF}OK{CR}{LF}
  - parameter:
    - status: socket B connection status.
      - "connected": connected
      - "disconnected": disconnected

32) AT+REGEN

- function: query or set enable/disable register package.
- format:
  - query parameter introductions:
    AT+REGEN=?{CR}
    {CR}{LF}+REGEN:<"on","off">{CR}{LF}{CR}{LF}OK{CR}{LF}
  - query current value of parameter:
AT+REGEN{CR} or AT+REGEN?{CR}
{CR}{LF}+REGEN:status{CR}{LF}{CR}{LF}OK{CR}{LF}
◆ set parameter:
   AT+REGEN=status{CR}
   {CR}{LF}OK{CR}{LF}
◆ parameter :
   ◆ status : enable or disable register package
       ● “on” : enable
       ● “off” : disable

33) AT+REGTP
◆ function: query or set register package data type.
◆ format :
   ◆ query parameter introductions:
      AT+REGTP=?{CR}
      {CR}{LF}+REGTP:<"ICCID","IMEI","REGID","REGDT">{CR}{LF}{CR}{LF}OK{CR}{LF}
   ◆ query current value of parameter:
      AT+REGTP{CR} or AT+REGTP?{CR}
      {CR}{LF}+REGTP:type{CR}{LF}{CR}{LF}OK{CR}{LF}
   ◆ set parameter:
      AT+REGTP=type{CR}
      {CR}{LF}OK{CR}{LF}
◆ parameter :
   ◆ type : type of register data
       ● “ICCID” : ICCID code
       ● “IMEI” : IMEI code
       ● “REGID” : register ID ( for D2D function )
       ● “REGDT” : user-defined data

34) AT+REGID
◆ function: query or set register ID (used for D2D).
◆ format :
   ◆ query parameter introductions:
      AT+REGID=?{CR}
      {CR}{LF}+REGID:<id>{CR}{LF}{CR}{LF}OK{CR}{LF}
   ◆ query current value of parameter:
      AT+REGID{CR} or AT+REGID?{CR}
      {CR}{LF}+REGID:id{CR}{LF}{CR}{LF}OK{CR}{LF}
   ◆ set parameter:
      AT+REGID=id{CR}
      {CR}{LF}OK{CR}{LF}
35) AT+REGDT

- **function**: query or set register user-defined data.
- **format**:
  - query parameter introductions:
    ```
    AT+REGDT=?{CR}
    {CR}{LF}+REGDT:<data>{CR}{LF}{CR}{LF}OK{CR}{LF}
    ```
  - query current value of parameter:
    ```
    AT+REGDT{CR} or AT+REGDT?{CR}
    {CR}{LF}+REGDT:data{CR}{LF}{CR}{LF}OK{CR}{LF}
    ```
  - set parameter:
    ```
    AT+REGDT=data{CR}
    {CR}{LF}OK{CR}{LF}
    ```
- **parameter**:
  - data: user-defined register data, hex string, max length is 80 bytes,
    for example, “7777772E7573722E636E” means “www.usr.cn” in ASCII.

36) AT+REGSND

- **function**: query or set register package sending type.
- **format**:
  - query parameter introductions:
    ```
    AT+REGSND=?{CR}
    {CR}{LF}+REGSND:<"link","data","link&data">{CR}{LF}{CR}{LF}OK{CR}{LF}
    ```
  - query current value of parameter:
    ```
    AT+REGSND{CR} or AT+REGSND?{CR}
    {CR}{LF}+REGSND:type{CR}{LF}{CR}{LF}OK{CR}{LF}
    ```
  - set parameter:
    ```
    AT+REGSND=type{CR}
    {CR}{LF}OK{CR}{LF}
    ```
- **parameter**:
  - type: sending type
    - “link”: send register data when socket connects
    - “data”: send register data as the head of every TCP/UDP package
    - “link&data”: support both of above two ways

37) AT+HEARTEN

- **function**: query or set enable/disable heartbeat.
- **format**:
  - query parameter introductions:
AT+HEARTEN=?{CR}
{CR}{LF}+HEARTEN:"on","off">{CR}{LF}{CR}{LF}OK{CR}{LF}
◆ query current value of parameter:
  AT+HEARTEN{CR} or AT+HEARTEN?{CR}
  {CR}{LF}+HEARTEN:status{CR}{LF}{CR}{LF}OK{CR}{LF}
◆ set parameter:
  AT+HEARTEN=status{CR}
  {CR}{LF}OK{CR}{LF}
  parameter :
  ◆ status : enable/disable heartbeat function
       ● “on” : enable
       ● “off” : disable

38) AT+HEARTDT
◆ function : query or set heartbeat data.
◆ format :
  ◆ query parameter introductions:
    AT+HEARTDT=?{CR}
    {CR}{LF}+HEARTDT:"data">{CR}{LF}{CR}{LF}OK{CR}{LF}
  ◆ query current value of parameter:
    AT+HEARTDT{CR} or AT+HEARTDT?{CR}
    {CR}{LF}+HEARTDT:data{CR}{LF}{CR}{LF}OK{CR}{LF}
  ◆ set parameter:
    AT+HEARTDT=data{CR}
    {CR}{LF}OK{CR}{LF}
  parameter :
   ◆ data : heartbeat data, hex string, max length is 80 bytes,
      for example, “7777772E7573722E636E” means “www.usr.cn” in ASCII.

39) AT+HEARTTP
◆ function : query or set heartbeat package sending type.
◆ format :
  ◆ query parameter introductions:
    AT+HEARTTP=?{CR}
    {CR}{LF}+HEARTTP:"COM","NET">{CR}{LF}{CR}{LF}OK{CR}{LF}
  ◆ query current value of parameter:
    AT+HEARTTP{CR} or AT+HEARTTP?{CR}
    {CR}{LF}+HEARTTP:type{CR}{LF}{CR}{LF}OK{CR}{LF}
  ◆ set parameter:
    AT+HEARTTP?type{CR}
    {CR}{LF}OK{CR}{LF}
  parameter :
40) AT+HEARTTM
- function: query or set heartbeat time.
- format:
  - query parameter introductions:
    AT+HEARTTM=?{CR}
    {CR}{LF}+HEARTTM:="time">{CR}{LF}{CR}{LF}OK{CR}{LF}
  - query current value of parameter:
    AT+HEARTTM{CR} or AT+HEARTTM?{CR}
    {CR}{LF}+HEARTTM:time{CR}{LF}{CR}{LF}OK{CR}{LF}
  - set parameter:
    AT+HEARTTM=time{CR}
    {CR}{LF}OK{CR}{LF}
- parameter:
  - time: strobe period, unit is second

41) AT+HTTP
- function: query or set HTTP request type.
- format:
  - query parameter introductions:
    AT+HTTP=?{CR}
    {CR}{LF}+HTTPP:"GET","POST">{CR}{LF}{CR}{LF}OK{CR}{LF}
  - query current value of parameter:
    AT+HTTPP{CR} or AT+HTTPP?{CR}
    {CR}{LF}+HTTPP:type{CR}{LF}{CR}{LF}OK{CR}{LF}
  - set parameter:
    AT+HTTPP=type{CR}
    {CR}{LF}OK{CR}{LF}
- parameter:
  - type: HTTP request type
    - "GET": get
    - "POST": post

42) AT+HTPURL
- function: query or set HTTP URL.
- format:
  - query parameter introductions:
    AT+HTPURL=?{CR}
AT+HTTPPRIVATE:

query current value of parameter:

AT+HTTPPRIVATE\[CR\]

\{CR\}{LF}OK{CR}{LF}OK{CR}{LF}

AT+HTTPPRIVATE=URL\{CR\}

\{CR\}{LF}OK{CR}{LF}

parameter:

URL : HTTP request URL

43) AT+HTPSV

function : query or set HTTP server address and port.

format :

query parameter introductions:

AT+HTPSV=?\{CR\}

\{CR\}{LF}OK{CR}{LF}

query current value of parameter:

AT+HTPSV\{CR\} or AT+HTPSV\{CR\}

\{CR\}{LF}OK{CR}{LF}

set parameter:

AT+HTPSV=address, port\{CR\}

\{CR\}{LF}OK{CR}{LF}

parameter:

address : server address, IP or domain name

port : server port, 1~65535

44) AT+HTPHD

function : query or set HTTP request head.

format :

query parameter introductions:

AT+HTPHD=?\{CR\}

\{CR\}{LF}OK{CR}{LF}

query current value of parameter:

AT+HTPHD\{CR\} or AT+HTPHD\{CR\}

\{CR\}{LF}OK{CR}{LF}

set parameter:

AT+HTPHD=\{CR\}

\{CR\}{LF}OK{CR}{LF}

parameter:

head : HTTP request head
45) AT+DSTNUM

- function: query or set destination phone number.
- format:
  - query parameter introductions:
  
  ```
  AT+DSTNUM=?{CR}
  {CR}{LF}+DSTNUM:"number"{CR}{LF}{CR}{LF}OK{CR}{LF}
  ```
  - query current value of parameter:
  
  ```
  AT+DSTNUM{CR} or AT+DSTNUM?{CR}
  {CR}{LF}+DSTNUM: number{CR}{LF}{CR}{LF}OK{CR}{LF}
  ```
  - set parameter:
  
  ```
  AT+DSTNUM=number{CR}
  {CR}{LF}OK{CR}{LF}
  ```
  - parameter:
  
  ```
  - number: destination phone number in “SMS” mode.
  ```

46) AT+SMSEND

- function: send SMS message.
- format:
  - query parameter introductions:
  
  ```
  AT+SMSEND=?{CR}
  {CR}{LF}+SMSEND:"number",<,1,2,3>,"data"{CR}{LF}{CR}{LF}OK{CR}{LF}
  ```
  - set parameter:
  
  ```
  AT+SMSEND=number,type,data{CR}
  {CR}{LF}OK{CR}{LF}
  ```
  - parameter:
  
  ```
  - number: destination phone number
  - type: coding scheme
  - 1: ASCII coding, compressed
  - 2: 8 bits coding, not compressed
  - 3: UCS8 coding
  - data: content of SMS message
  ```

Appendix A: Contact
Appendix B: Disclaimer

This document provides information about USR-GM3/GM3s modules, this document does not grant any license to intellectual property rights. Except the responsibility declared in the product sale clause, USR does not assume any other responsibilities. In addition, USR does not make any warranties for the sale and use of this product, including the suitability of the product for a particular purpose, merchantability or fitness for any patent, copyright or other intellectual property infringement, etc. USR may make changes to specifications and product descriptions without notice.

Appendix C: Update History

2015-6-20  V1.0  basic version created
2015-6-20  V1.0.6  fix some errors, change reload pin function
2015-9-11  V1.0.7  increased use of setting software method
2015-10-12 V1.1.0  fix some errors, Added some instructions about GM3s

<END>