USR-GPRS232-730 Guide Line

File Version: V1.0.13.01

Contents

1. Configuring methods

To configure module, user can use AT commands to configure. There are three methods to send AT commands.

- Serial AT command
- SMS AT command
- Transparent AT command

To configure and test the module, we provide some software:

- Setup software:

http://www.usriot.com/usr-gm3-setup-software/

- Test Software:

http://www.usriot.com/usr-tcp-test-v1-3/

1.1.Serial AT command

When module works in network transparent transmission mode, SMS transparent transmission mode or HTTPD Client mode, user can enter serial AT command mode. Then user can send AT commands to module to configure or query the parameters by serial. Setup software is based on this function. Settings will take effect after resetting.

To enter serial AT command mode, steps as follows:

1. Powering up the USR-GPRS232-730, connecting the antenna and serial cable.
2. Sending the "+++" to USR-GPRS232-730 by serial, the USR-GPRS232-730 will return an "a" if it receives "+++" successfully.
3. Sending an "a" to the USR-GPRS232-730 immediately after receiving the "a". USR-GPRS232-730 will return "+ok" if it receives the "a" successfully.
4. Then you can send AT commands to USR-GPRS232-730. USR-GPRS232-730 will return "+ok" or "+ERR". Command is right and succeed to configure the USR-GPRS232-730 if it returns "+ok". Failing to configure the USR-GPRS232-730 if it returns "+ERR".
5. The settings will take effect after resetting, user can send AT+Z to reset the module. After resetting, USR-GPRS232-730 will work in one of the three work modes(Network transparent transmission mode, SMS transparent transmission mode or HTTPD Client mode).
6. FAQ about serial AT command:

http://www.usriot.com/enter-serial-command-mode/

In serial AT command mode, user can send AT command to configure and query parameters and status. Every serial AT command is end by ENTER (in HEX format that should be 0x0D 0x0A). For example, to query the serial port parameters, user should send this command.

AT+UART

1.2.SMS AT command

If USR-GPRS232-730 is in fields or user don't know the serial parameters, user can use SMS AT command to configure the USR-GPRS232-730. The SMS AT command format is as follow. Settings will take effect after resetting.

> Passwords#AT command

For example, user can send the command below to query the serial port parameters of the USR-GPRS232-730:

> usr.cn#AT+UART

usr.cn is default password, user can modify it to user own password(To modify the password, user can use AT+CMDPW). AT+UART is the AT command to query the serial port parameters. There should be '#' between the password and command.

And from Firmware Version V3.0, USR-GPRS232-730 starts to support sending more than one AT command by only one message. When user wants to send one message with more than one AT command, user should add ";" after each AT command.

For example, user can send the command below to query the serial port parameters and socket A parameters of the USR-GPRS232-730 simultaneously:

> usr.cn #AT+UART;usr.cn#AT+SOCKA;

1.3.Transparent AT command

When module in transparent mode, user can use transparent AT command to configure or query parameters via network or serial port. The format is as follow. Settings will take effect after resetting.

> Passwords#AT command

For example, if user want to query serial port parameters via network or serial port, user can send the command below.

> usr.cn#AT+UART

usr.cn is default password, user can modify it to user own password(To modify the password, user can use AT+CMDPW). AT+UART is the AT command to query the serial port parameters. There should be '#' between the password and command.

2. Function settings

Every time USR-GPRS232-730 powers on, it will work in work mode (Network transparent transmission mode, SMS transparent transmission mode or HTTPD client mode). Then user can enter AT command mode and use AT command to configure it. New parameters will take effect after resetting. If commands have no reply, please check whether add an ENTER after every command.

User can also configure USR-GPRS232-730 by setup software which is based on serial AT command.

2.1.APN

Different operator have different APN(access point name). If user uses the SIM card from the operator, must know the APN. User can ask SIM card operator for APN information. There are three parameters about APN. Those are APN code, username and password. Sometimes only configuring APN is enough.

For example, we got the SIM card from China mobile, they only tell me APN. AT command as follow:

> **AT+APN="CMNET**",""","""

2.2.Work mode

2.2.1.Network transparent transmission mode

In this work mode, USR-GPRS232-730 can make a bidirectional connection. This connection is transparent transmission. Data from serial device can be received in network, and network data can also be sent to serial device.

The network connection is based on socket. USR-GPRS232-730 supports two sockets: socket A and socket B. Socket A and socket B are independent. Therefore serial data can be sent to two different servers.

Related AT commands:

Command Name	Command Functions
AT+WKMOD	Query/Set work mode
AT+SOCKA	Query/Set socket A parameters
AT+SOCKB	Query/Set socket B parameters
AT+SOCKAEN	Query/Set socket A enable/disable
AT+SOCKBEN	Query/Set socket B enable/disable
AT+SOCKASL	Query/Set socket A non-persistent connection enable/disable
AT+SOCKBSL	Query/Set socket B non-persistent connection enable/disable
AT+SOCKALK	Query connection status of socket A
AT+SOCKBLK	Query connection status of socket B
AT+SOCKIDEN	Query /Set displaying socket ID function enable/disable

Table 1 Network transparent transmission mode AT commands

Example:

Use AT commands:

1.Set the work mode as network transparent transmission mode

> **AT+WKMOD="NET"**

2.Enable the socket A

> **AT+SOCKAEN="ON"**

3.Set socket A as TCP Client

> **AT+SOCKA="TCP","test.usr.cn",2317**

4.Set socket A as persistent connection

> **AT+SOCKASL=LONG**

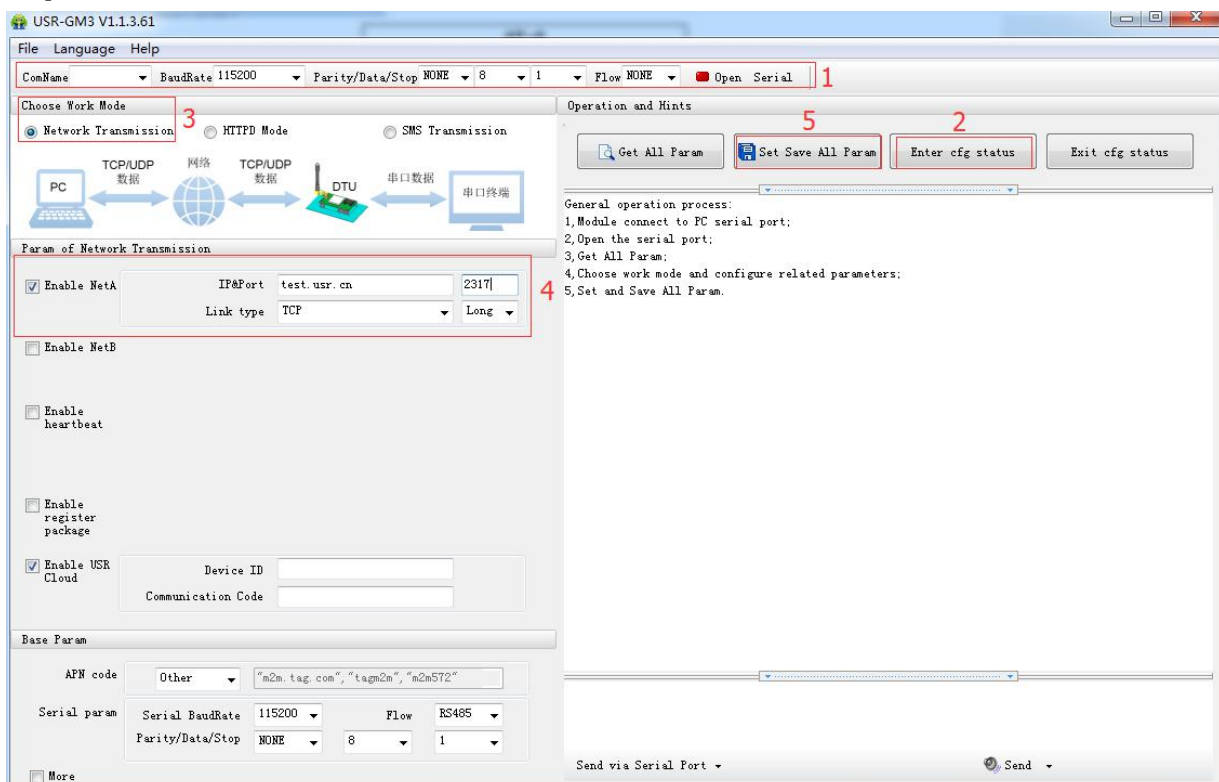5.Save and reset：

> **AT+S**

Use setup software:

Figure 1 Network transparent transmission mode

2.2.2.HTTPD Client mode

In this work mode, user should configure the HTTP URL, HTTP header data, HTTP server address and HTTP server port firstly. Serial data can be packaged into HTTP format and sent to HTTP server. The buffer of serial receiving is 1KB. User's packages can not over 1KB.

Related AT commands:

Command Name	Command Function
AT+WKMOD	Query/Set work mode
AT+ HTPTP	Query/Set HTTP requesting mode
AT+ HTPURL	Query/Set URL
AT+ HTPSV	Query/Set server address and port
AT+ HTPHD	Query/Set HTTP header data
AT+ HTPPK	Query/Set filtering HTTP header of response data function enable/disable

Table 2 HTTPD Client mode AT commands

Example:

Use AT commands:

1.Set as HTTPD client mode:

> **AT+WKMOD="HTTPD"**

2.Set as HTTP GET requesting method:

> **AT+HTPTP="GET"**

3.Set HTTP URL:

> **AT+HTPURL="/1.php?"**

4.Set HTTP server:

> **AT+HTPSV="test.usr.cn",80**

5.Set HTTP header:

> **AT+HTPHD="Accept:text/html[0D][0A]**
> **Accept-Language:zh-CN[0D][0A]"**

6.Save and reset:

> **AT+S**

7.After resetting, user can send 'data=www.usr.cn' from serial port device, and serial port can receive
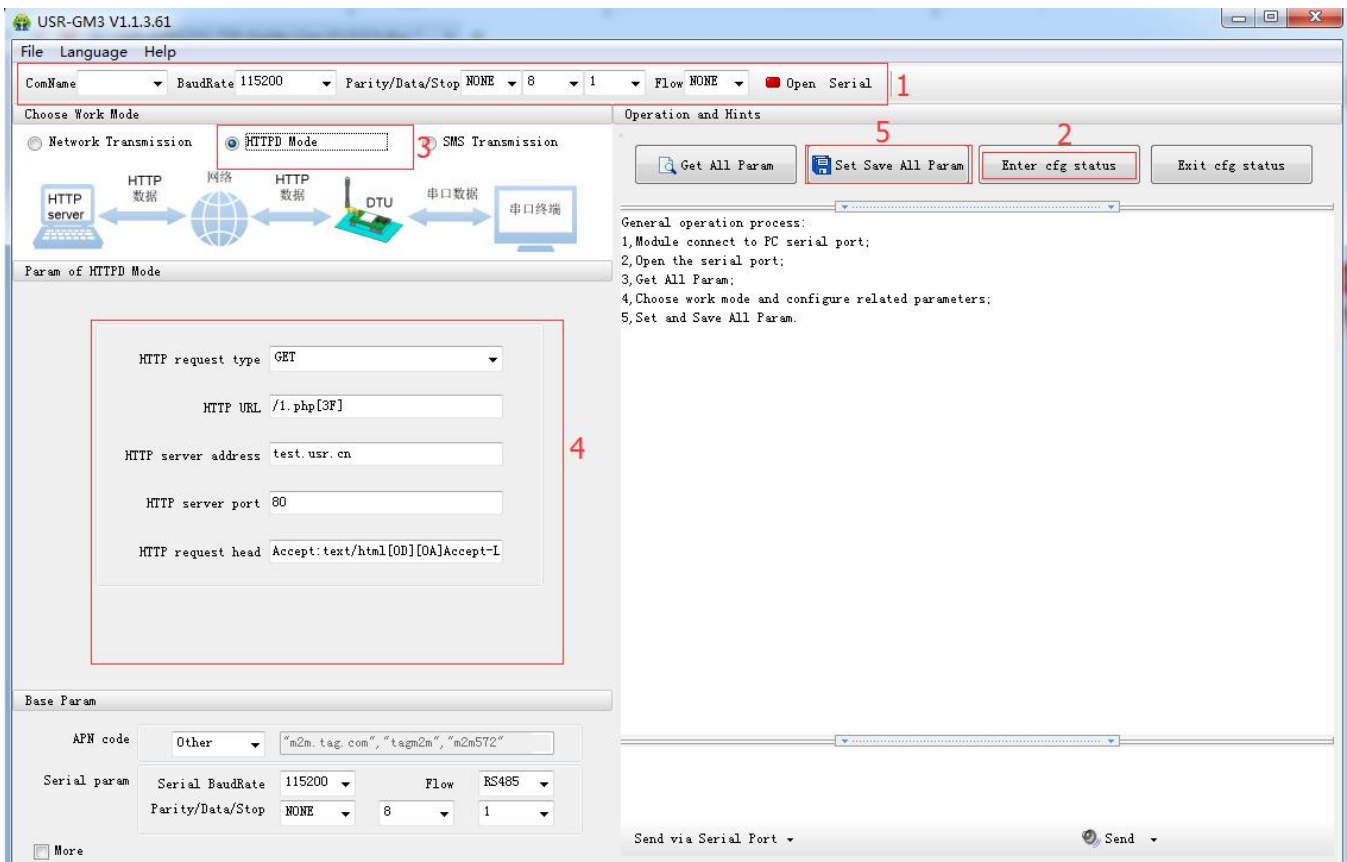
'[www.usr.cn]' from server.

Use setup software:

Figure 2 HTTPD Client mode

Note: "test.usr.cn/1.php", port 80 is our company HTTP GET test server; "test.usr.cn/2.php", port 80 is our company HTTP POST test server.

2.2.3.SMS transparent transmission mode

This work mode is used to transfer serial data in SMS format to target mobile and receive SMS data from target mobile.

Related AT commands:

Command Name	Command Functions
AT+WKMOD	Query/Set work mode
AT+DSTNUM	Query/Set target telephone number

Table 3 SMS transparent transmission mode AT commands

Example:

Use AT commands:

1.Set work mode as SMS transparent transmission mode:

AT+WKMOD="SMS"

2.Set the target mobile number:

> **AT+DSTNUM="XXXXXXXX"**

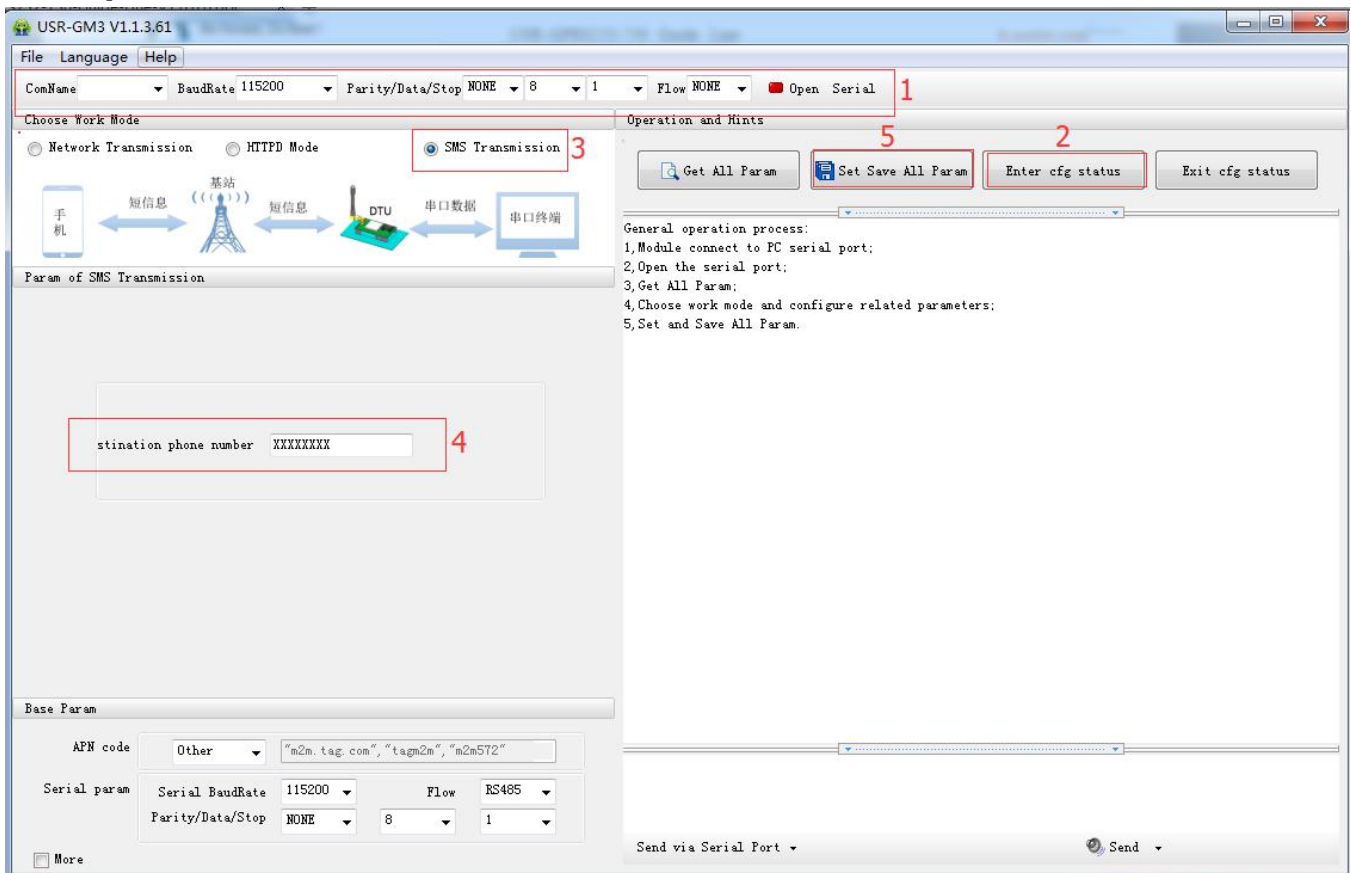3.Save and reset:

> **AT+S**

Use setup software:

Figure 3 SMS transparent transmission mode

2.3.Serial Port

2.3.1.Basic Parameters

Name	Parameter range
Baud rate	1200, 2400, 4800, 9600, 14400, 19200, 38400, 57600, 115200, 128000, 230400, 460800, 921600
Data bits	7, 8
Stop bits	1, 2
Parity	NONE, EVEN, ODD
Flow control	FC: Hardware flow control NFC: No flow control 485: Enable RS485 (terminal)

Table 4 Serial port parameters

2.3.2.Serial package methods

USR-GPRS232-730 adopts fixed Packaging time-200ms.

2.3.3.RS485

If user wants to use RS485 (terminal) as serial port, user should enable RS485 firstly.

Whether user enables or disables this function, RS232 is available.

Example:
Enable the RS485:

AT+UART=115200,8,1,NONE,RS485

Disable the RS485:

AT+UART=115200,8,1,NONE,NFC

2.3.4.Baud rate synchronization

When module works with USR devices or software, serial parameters will change dynamically according to network protocol. User can modify serial parameters by sending data conformed to specific protocol via network. It is temporary, after resetting DTU, the parameters will back to original parameters.

Protocol is 8 bytes, please refer to the form below.

Protocol Format:

Name	Header	Baud rate	Function Bits	Checksum
Bytes number	3	3	1	1
State	Fixed Header	Baud rate High nibble first	Please refer to next form	Sum of Baud rate(3 bytes) and Function bits
Example (115200,N,8,1)	55 AA 55	01 C2 00	83	46
Example (9600,N,8,1)	55 AA 55	00 25 80	83	28

Table 5 Baud rate synchronization protocol format

Function Bits:

Bits	Stats	Value	Description
1:0	Data bits	00	5 bit data bits
		01	6 bit data bits
		10	7 bit data bits
		11	8 bit data bits
2	Stop bits	0	1 bit stop bits
		1	2 bit stop bits
3	Parity	0	Disable
		1	Enable
5:4	Parity methods	00	ODD
		01	EVEN
		10	Mark
7:6	Undefined	00	0

Table 6 Function bits

2.4.Other Functions

2.4.1.Identity packet

Related AT commands:

Command Name	Command Function
AT+ REGEN	Query/Set identity packet function enable/disable
AT+ REGTP	Query/Set type of identity packet
AT+REGID	Query/Set registration ID
AT+ REGDT	Query/Set user editable identity packet data in HEX format
AT+ REGSND	Query/Set identity packet sending method

Table 7 Identity packet AT commands

Example:

Use AT commands:

1.Enable the identity packet:

AT+ REGEN=ON

2.Set identity packet as user editable packet:

AT+ REGTP="REGDT"

3.Set user editable identity packet data:

AT+REGDT="7777772E7573722E636E"

4.Set sending identity packet before first package after establishing connection:

AT+ REGSND="link"
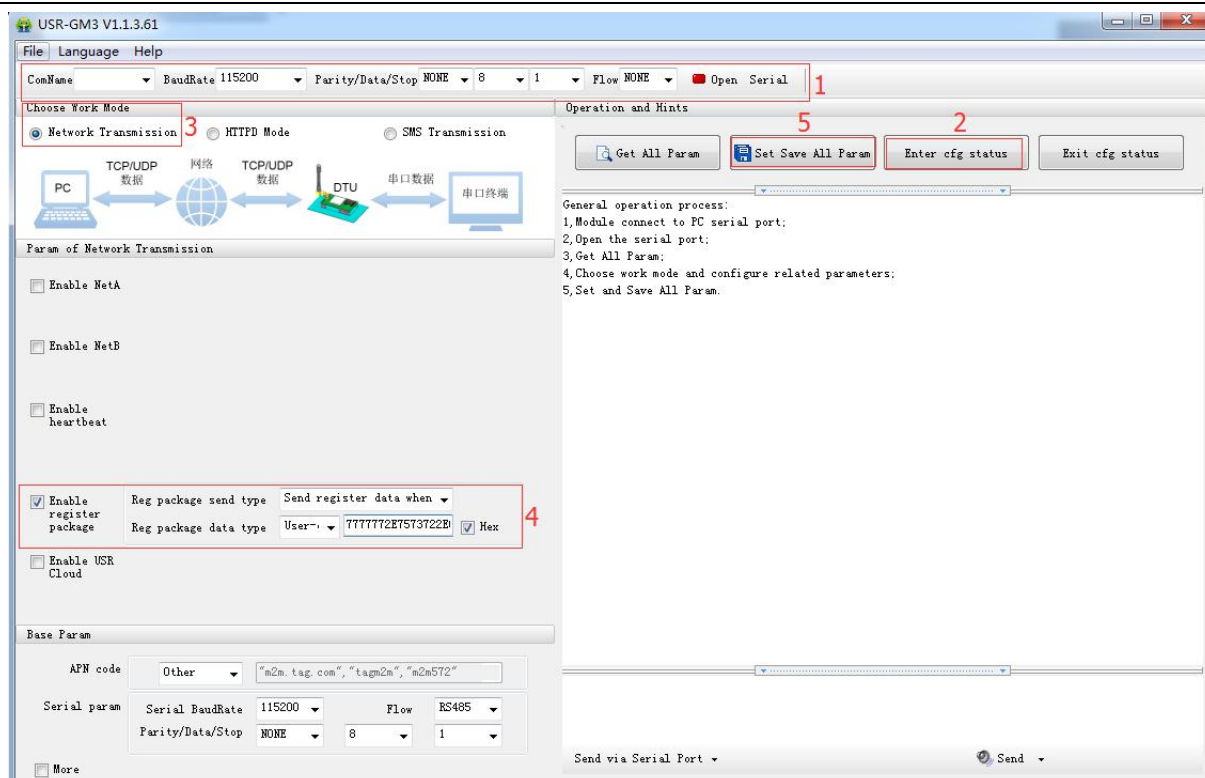
5. Save and reset:

AT+ S

Use setup software:

Figure 4 Identity packet

2.4.2.Heartbeat packet

Related AT command is as follow:

Command	Command function
AT+ HEARTEN	Set/Query heartbeat packet function enable/disable
AT+ HEARTDT	Set/Query heartbeat packet data
AT+ HEARTTP	Set/Query heartbeat packet sending method
AT+ HEARTTM	Set/Query heartbeat packet interval

Table 8 Heartbeat packet AT commands

Example:

Use AT commands:

1.Enable heartbeat packet function:

AT+ HEARTEN=ON

2.Set heartbeat packet data:

AT+ HEARTDT=7777772E7573722E636E

3.Set the heartbeat packet is sent to network side:

AT+ HEARTTP=NET

4.Set the heartbeat packet interval as 30s:

AT+ HEARTTM=30

5.Save and reset:

AT+ S

Use setup software:
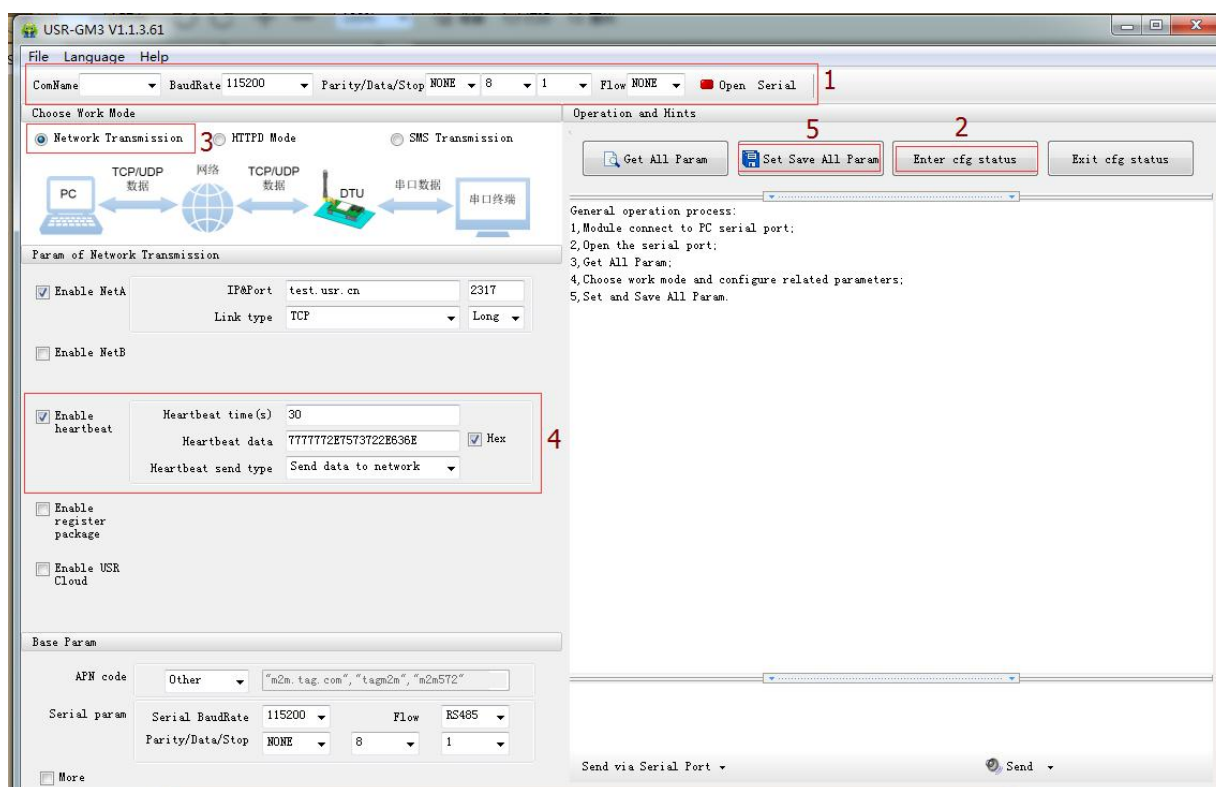

Figure 5 Heartbeat packet

2.4.3.USR cloud

Related AT commands are as follows:

Command	Command function
AT+ CLOUDEN	Query/Set USR Cloud enable/disable
AT+ CLOUDID	Query/Set USR Cloud ID
AT+ CLOUDPA	Query/Set USR Cloud password

Table 9 USR cloud AT commands

Example:

Use AT commands:

1.Enable USR cloud function:

AT+CLOUDEN=ON

2.Set USR cloud ID and password:

> **AT+CLOUDID="10011111100000111111"**
> **AT+CLOUDPA="0000test"**

3.Set socket A to USR cloud server:

> **AT+SOCKAEN=on**
> **AT+SOCKA="TCP","cloud.usr.cn",15000**

4.Save and reset:

> **AT+ S**

Use setup software:
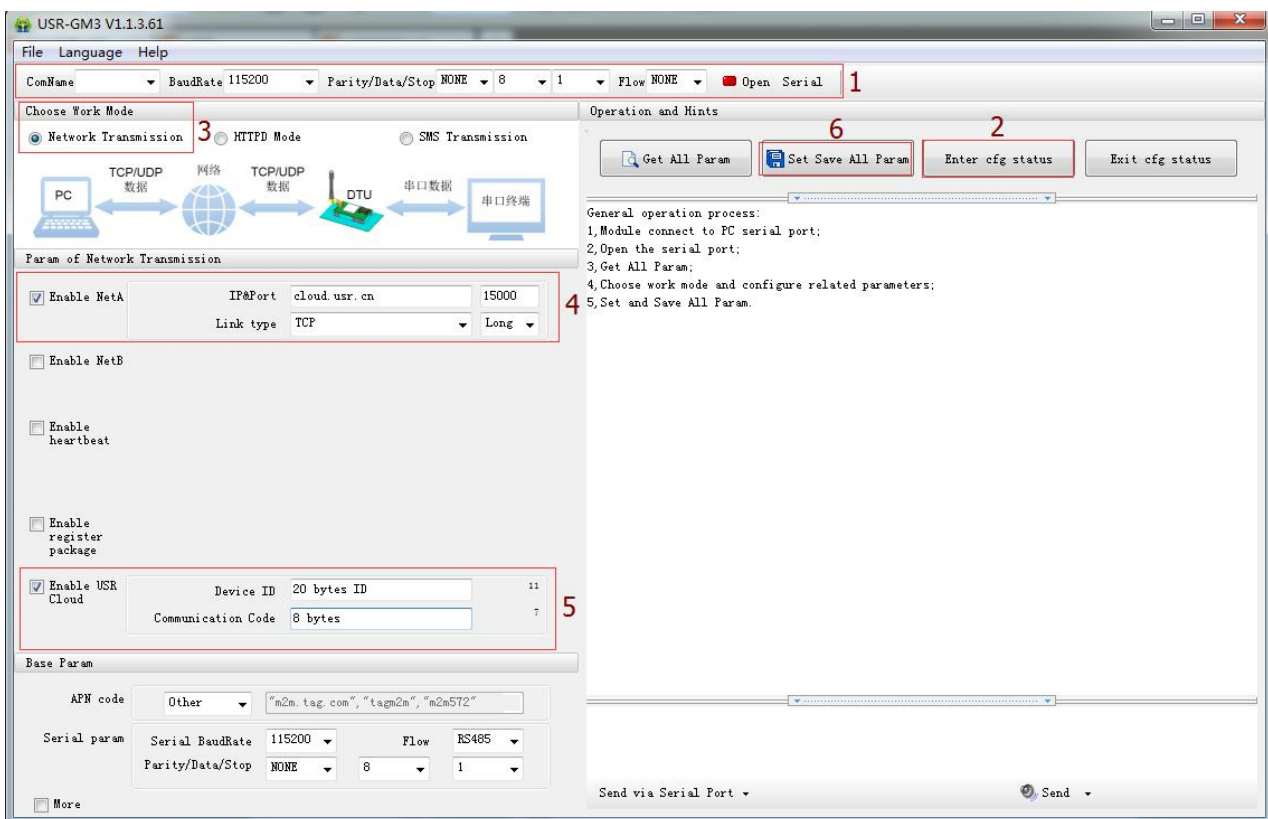

Figure 6 USR cloud

2.4.4.Sleep mode

Related AT commands are as follows:

Command	Command function
AT+ SLEEP	Query/Set Sleep mode enable/disable
AT+ SLEEPTIM	Query/Set time to enter Sleep mode

Table 10 Sleep mode AT commands

2.4.5.Upgrading firmware

Please ask our company salespersons for needed firmware version and upgrading tools if user wants to upgrade firmware version.

3. AT Command Set

Every AT Command will have a response from USR-GPRS232-730. To enter serial AT command mode, please refer to this FAQ: **http://www.usriot.com/enter-serial-command-mode/**.

We have special document for all AT commands function description and their details. User can download **USR-GM3-AT-Command-Set_V1.0.1** for further needs.

3.1.Character

Character	Meaning	Hex
<AT+>	AT Command Header	41 54 2B
<CR>	Carriage Return, 0x0D in Hex	0D
<LF>	Line Feed, 0x0A in Hex	0A
,	Separator of multi parameters	2C
=	Separator between the command and parameters	3D
:	Between the [CMD] and [PARA]	3A
[CMD]	Command Name	ASCII
[PARA]	Parameter	ASCII

Table 11 AT commands character

4.Contact Us

Company: Jinan USR IOT Technology Limited

Address: Floor 11, Building 1, No. 1166 Xinluo Street, Gaoxin District, Jinan, Shandong, 250101, China

Web: www.usriot.com

Support: h.usriot.com

Email: **sales@usr.cn**

Tel: 86-531-88826739/86-531-55507297

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6.Update History

2017-07-14   V1.0.0.0 established.

2017-10-23   V1.0.13.01 updated. Modified some words to standards and corrected spelling/grammatical mistakes. Optimized whole manual arrangement. Changed related pictures to new 730 pictures. Modified SMS AT command part.