

USR-G760c User Manual

File Version: V1.1



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1. Quick Start

This chapter aims at getting start USR-G760c quickly. It's recommended that user read this chapter systemically and operate it according to instruction to make a scientific knowledge. Following chapter will introduce specific details and instruction, user can read interested chapter according to need.

If you have any question, feed it back to customer center please:

<http://h.usriot.com>

1.1. Hardware Testing Environment



1.2. Data Transmission Testing

1. Power on the DTU, reload to factory defaults. Reload method please refer to Chapter 3.4.5
2. Open the USR Setup software for USR-G760, set correct serial parameters and open the serial port.
3. Input www.usriot.com in the left side of the software and click "send"

<Note>

Defaults: socket A is set to be TCP Client, destination IP is set to be test.usr.cn, destination port is set to be 2317

test.usr.cn:2317 is our USR testing server, it will return the data that received.

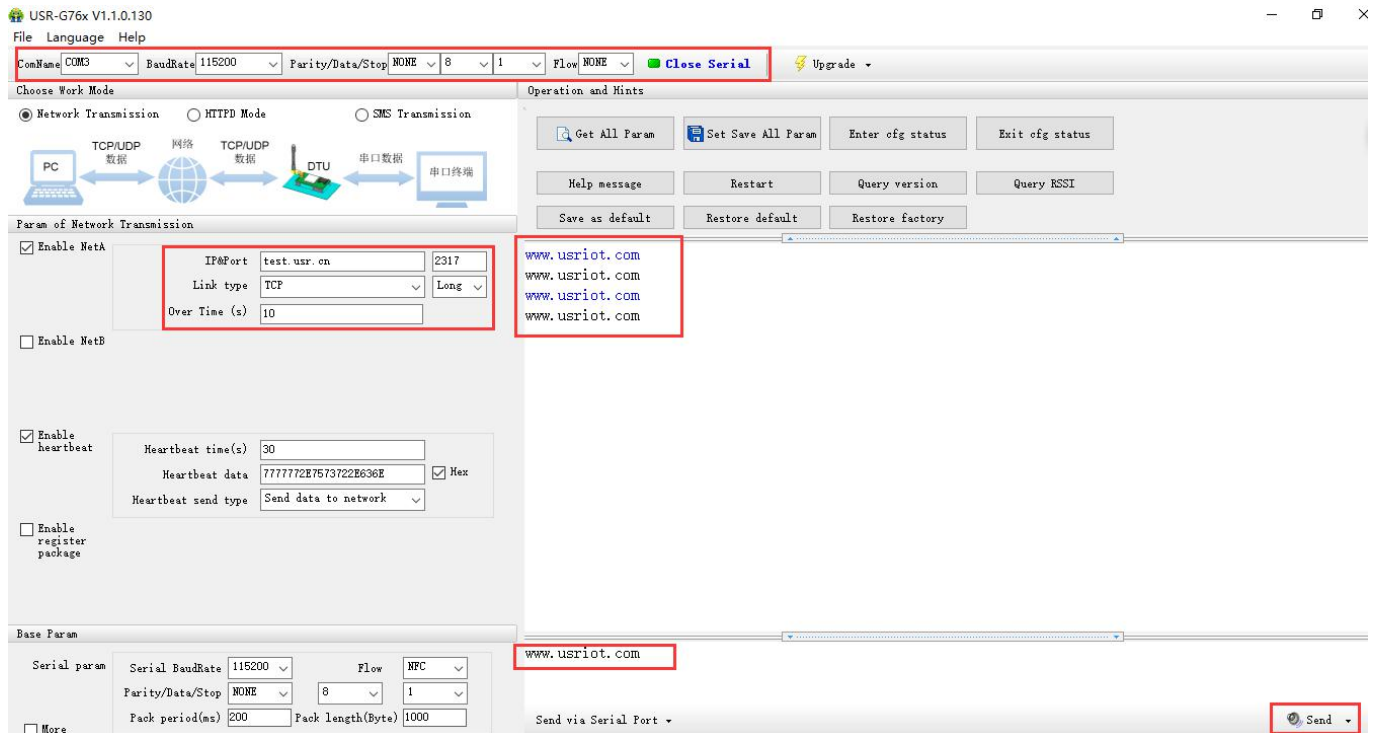


Figure 1 Transparent transmission diagram

2. Product Overview

2.1. Brief Introduction

USR-G760c is a 3G DTU which is apply to CDMA2000 network type, and supports CDMA2000 1xEV-DO Revision 0 and A high speed access. With “Transparent transmission” as core function and highly usability, user can integrate it to system, to realize data transmission based on CDMA2000

2.2. Features

- Support CDMA2000 1xEV-DO Revision 0 and A network
- Support 2 connections online at the same time, support TCP and UDP
- Support network register packet
- Support heartbeat packet data, can send to net or serial port
- Support remote setting via SMS
- Work mode: SMS transparent transmission mode, Network transparent transmission mode and HTTPD client mode
- Support sending English/Chinese SMS with simple commands
- Similar to RFC2217, can modify module serial parameters automatically
- RS232/RS485 interface

2.3. Parameters

	Parameter	Value
Wireless Parameter	Working Frequency	CDMA1X / 1xEV-DO rel.0/ 1xEV-DO rev. A 800 MHz /1900 MHz
	Receive Sensitivity	<-106.5dBm
	Max Launch Power	CDMA: 23dBm
	Data Width	Downstream: 3.1Mbps Upstream: 1.8Mbps
Hardware Parameter	Data Interface	RS232: 1200bps - 460800bps RS485: 1200bps - 460800bps
	Working Voltage	DC 5V~24V
	Working Current	average current 55mA@12V; peak current 230mA@12V
	Operating Temp	-30~70 degree centigrade
	Storage Temp	-40~85 degree centigrade
	Dimension	103 x 105 x 28(mm)
Software Parameters	Work Mode	Transparent transmission mode Serial command mode
	Setting Command	AT+command structure
	User Configuration	setting software

Form 1 Module Parameters

2.4. Hardware Introduction



Figure 2 Hardware Interface

2.5. Dimensions

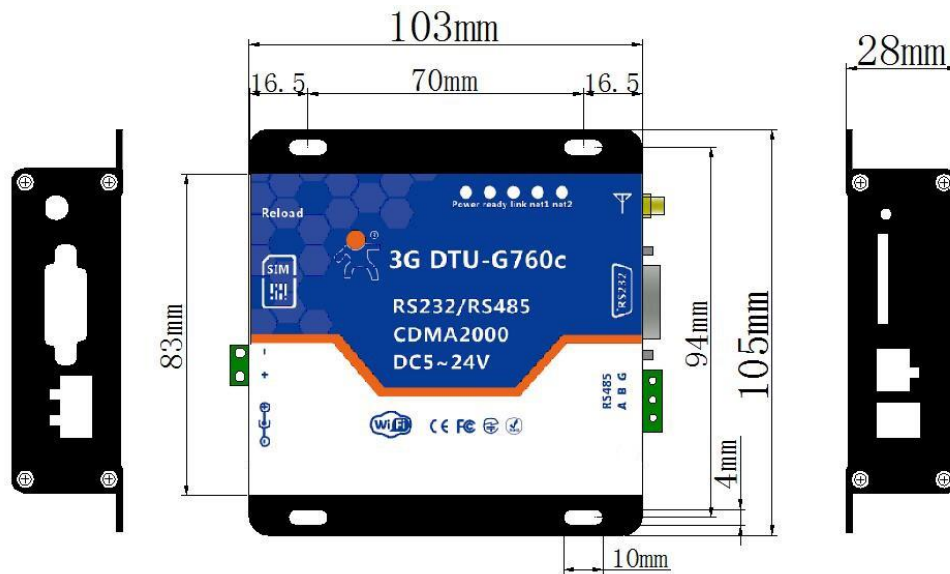


Figure 3 Hardware Dimensions

3. Functions

This chapter introduce the functions of module, as the following diagram shown, you can get an overall knowledge of it.

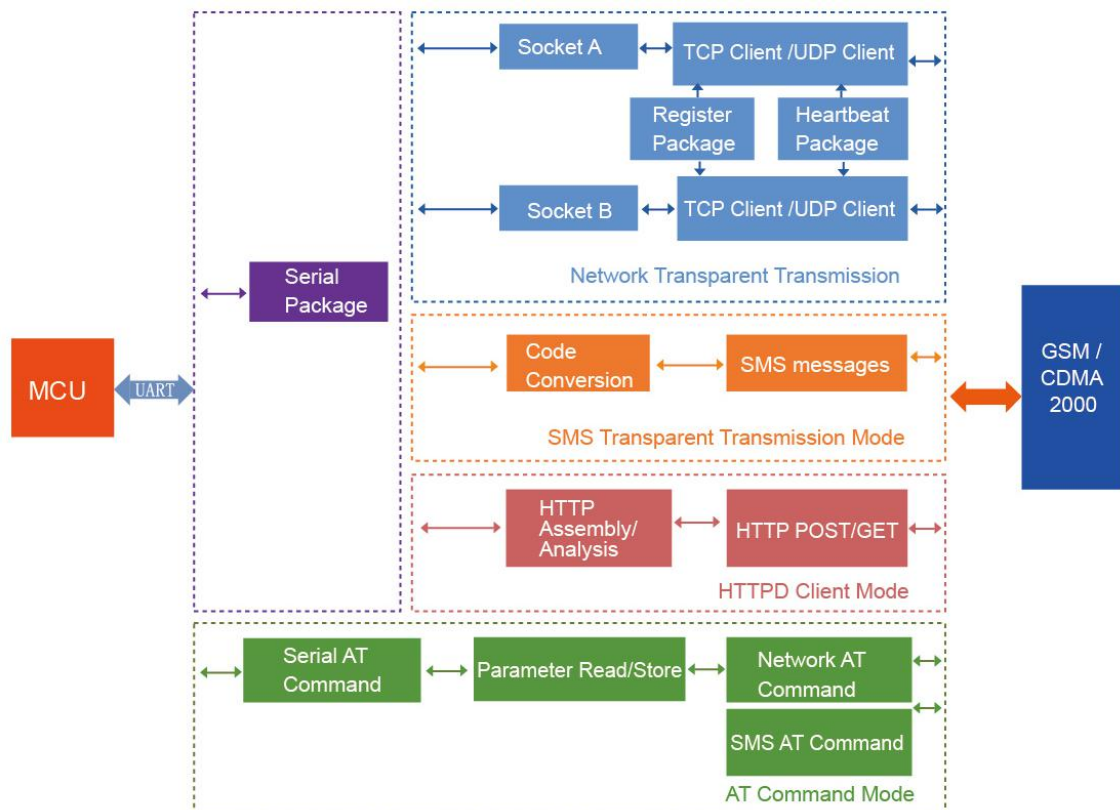


Figure 4. Function Diagram

3.1. Parameters Setting

Power on, module will connect to the server, get into working mode and open serial port according to pre-set parameters.

Preset parameters

- ❖ Work mode
 - SMS transparent transmission mode/Network transparent transmission mode/Httpd client mode
- ❖ Default connection parameters
 - Protocol
 - Destination IP
 - Destination Port
- ❖ Serial parameters
 - Baud rate
 - Data bit
 - Parity bit
 - Stop bit

After setting above parameters, restart the DTU, it will work under your settings. Following chapters will introduce each section.

3.2. Work Mode

There are 3 work mode in total:

- SMS transparent transmission mode,
- Network transparent transmission mode
- Httpd client mode

3.2.1. SMS Transparent Transmission Mode

In this mode, users' serial device can send SMS to cell phones. Or DTU receive the SMS by any phone and forward the SMS to serial device.

No need to pay attention to the data conversion process between serial data and SMS, users can realize transparent transmission between cell phone and serial device by simple settings.

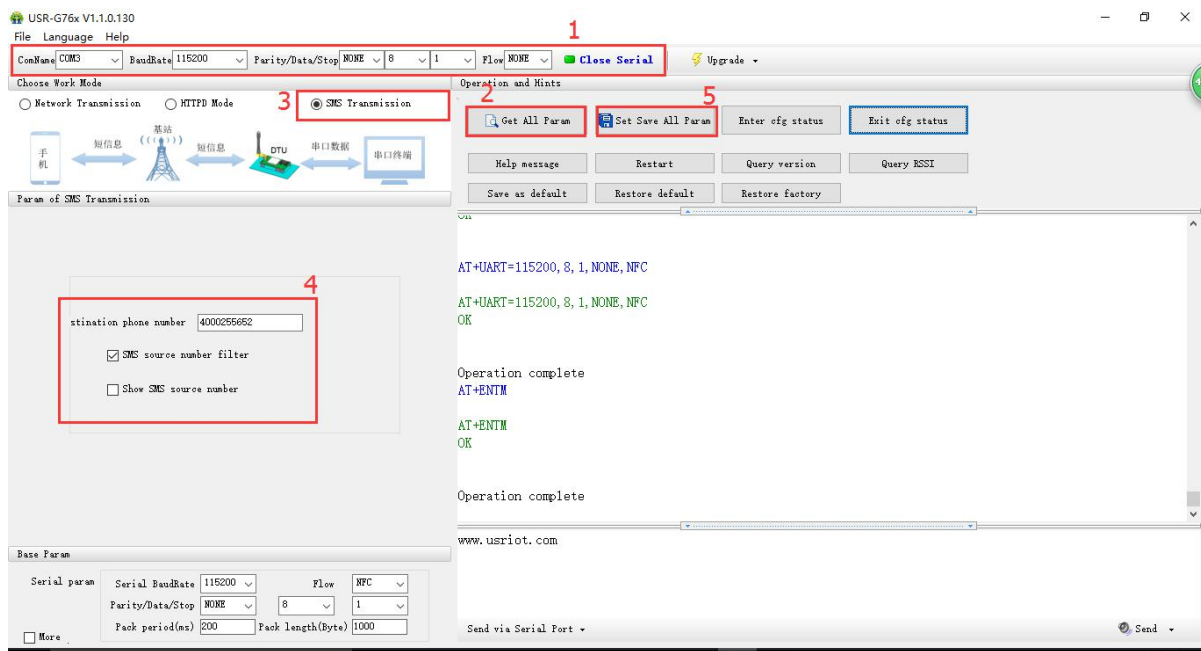
<Note>

Data Transparent Transmission means, in the process of transmission, DTU will NOT do any conversion on data, just clear transmission. Below is the same.

Setup by AT commands

1. Set work mode to be SMS transmit mode: AT+WKMOD=SMS
2. Set destination phone number: AT+DSTNUM=15866668888
3. Set filter SMS source phone number: AT+SMSFLT=ON

Setup by software



1. Open setup software “USR-G760c USR-G760 V1.0.0.392” or more advanced version. Set UART parameters according to the actual conditions and click “Open UART”
2. Click “Get All Param”, waiting until obtained all current parameters.
3. Choose “SMS transmission” in Choose work mode
4. Configure the “Destination” phone number as 400255652, choose the “SMS source number filter”.
5. Click “Set Save All Param”. After saving parameter, re-power the module.

3.2.2. Network Transparent Transmission Mode

In this mode, users’ serial device can send data to indicated server. Or DTU receive data from server and forward the data to serial device.

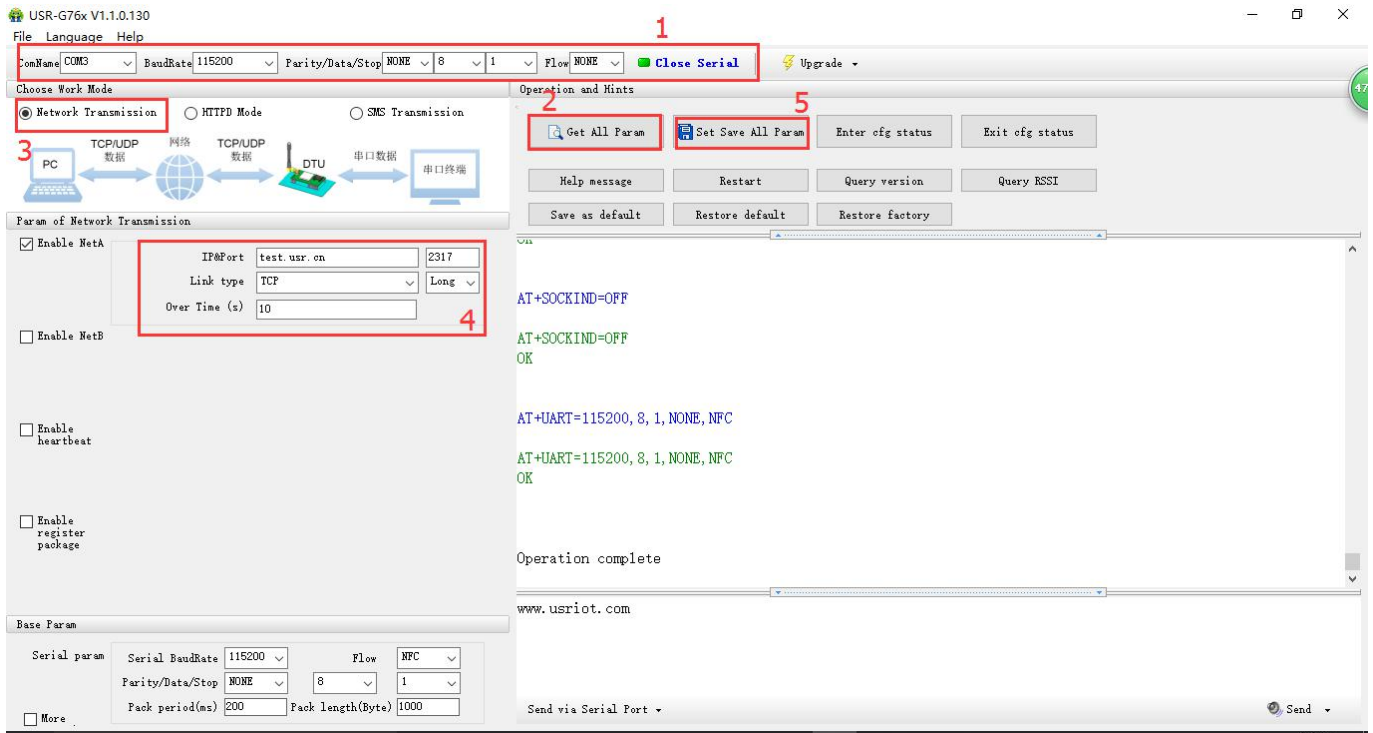
No need to pay attention to the data conversion process between serial data and network data packet, users can realize transparent transmission between server and serial device by simple settings.

USR-G760c support 2 socket connections online at the same time: socket A and socket B, they are independent. This DTU only support working at TCP Client and UDP Client.

Setup by AT command

1. Set work mode to be network transmit mode: AT+WKMOD=NET
2. Set to enable Socket A: AT+SOCKAEN=ON
3. Set Socket A to be TCP Client: AT+SOCKA=TCP,test.usr.cn,2317
4. Set Socket A to be long link: AT+SOCKASL=LONG

Setup by software



1. Open the software “USR-G760c V1.0.0.392” or higher version. Configure the COM port parameters and click the “Open Serial”
2. Click “Get All Param”, waiting until obtained all current parameters.
3. Choose “Network transmission” in choose work mode.
4. Set IP&Port to be test.usr.cn; 2317, Link type to be TCP; Long
5. Click “Set Save all Param”, After saving parameter, re-power the module.

3.2.3. Httpd Client Mode

In this mode, users’ serial device can send request data to indicated HTTP server. Then DTU receive data from HTTP server, analysis data and send the result to serial device.

No need to pay attention to the data conversion process between serial data and network data packet, users can realize data request from serial device to HTTP server.

<Note>

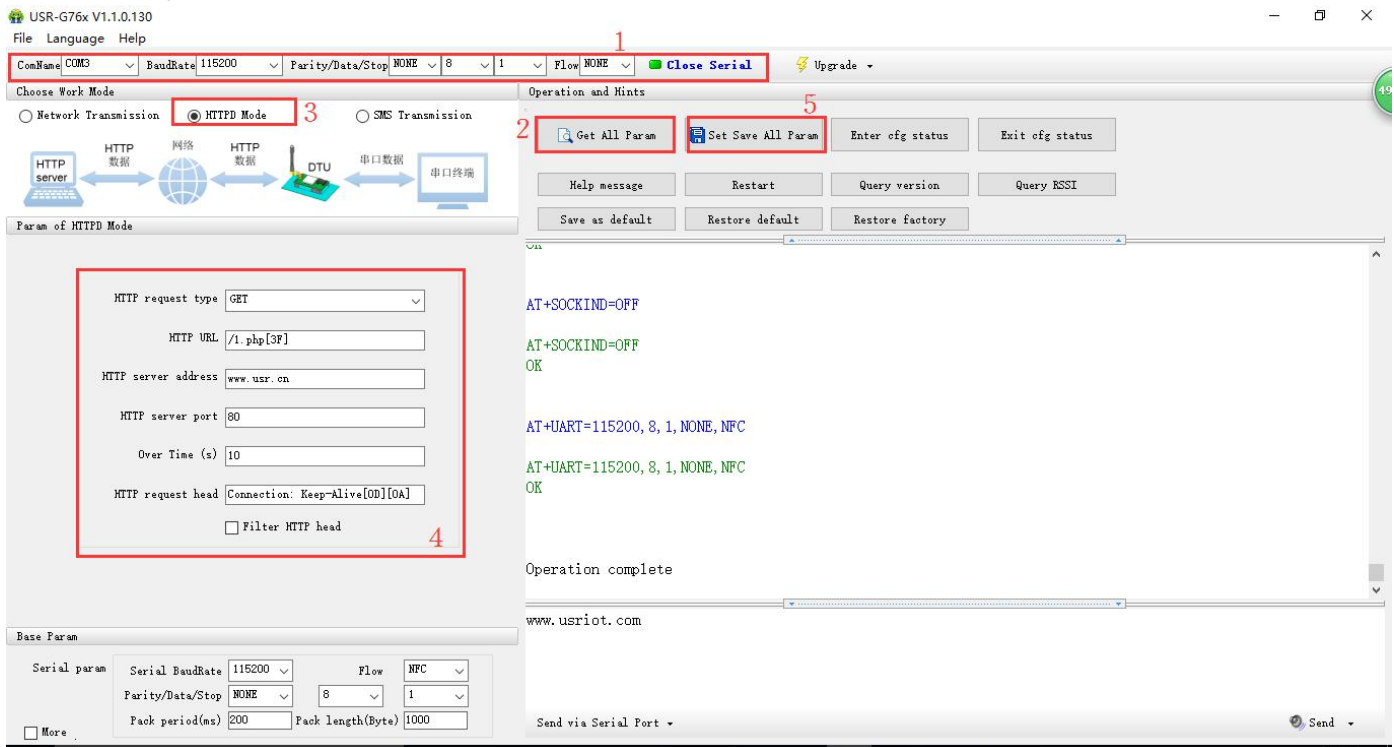
Some applications need the serial device to request data from HTTP server. But these places with serial devices, maybe not convenient to access the Internet through a router. If there exist BS SIGNAL, we can build a bridge for serial device and HTTP server with USR-G760c.

Setup by AT command

1. Set work mode to be HTTPD: AT+WKMOD=HTTPD
2. Set HTTP request method: AT+HTPTP=GET
3. Set HTTP request URL: AT+HTPURL=/1.php[3F]
4. Set HTTP request server: AT+HTPSV=test.usr.cn,80
5. Set HTTP request head information: AT+HTPHD=Connection: Keep-Alive[0D][0A]

6. Set HTTP request time out time: AT+HTPTO=10
7. Set whether filter response information packet header: AT+HTPFLT=ON

Setup by software



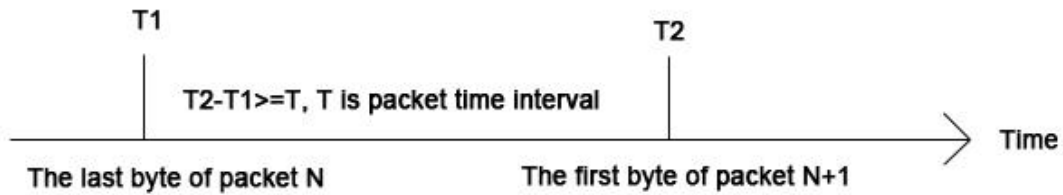
1. Open the software “USR-G760 USR-G760 V1.0.0.392” or higher version. Configure the COM port parameters and click the “Open Serial”
2. Click “Get All Param”, waiting until obtained all current parameters.
3. Select “HTTPD Mode” in Choose Work mode area.
4. Set HTTP request to be GET; HTTP URL to be “/1.php[3F]”; HTTP server address to be www.usr.cn; HTTP server port to be 80; Over time (timeout) to be 10; HTTP request head to be “Connection: Keep-Alive[0D][0A]”; Select “Filter HTTP head”
5. Click “Set Save all Param”, After saving parameter, re-power the module.

3.3. UART Frame Mechanism

3.3.1. Time Frame

When USR-G760c receive data from UART, it will keep checking the time interval of two adjacent bytes. If the time interval is greater than or equal to a “time threshold”, the frame is finished. Or the module will keep receiving data until data is greater than or equal to 1K, then send this frame to network by TCP or UDP packet. The “time threshold” here is packet time interval, range from 50ms~60000ms, default 200ms.

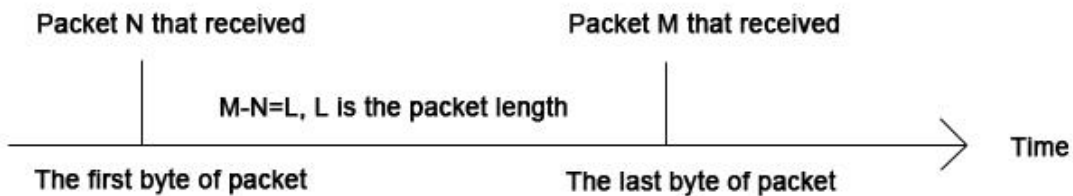
This can be set by AT command: AT+UARTFT=<time>



3.3.2. Length Frame

When USR-G760c receive data from UART, it will keep checking the received number of bytes. If the number of bytes is greater than or equal to a “length threshold”, the frame is finished. Then module will send this frame to network by TCP or UDP packet. The “length threshold” here is packet length, range from 1-1000, default 1000.

This can be set by AT command: `AT+UARTFL=<length>`



3.4. Features

3.4.1. Registration Packet Function

When USR-G760c send network data, it can add some additional information to realize some special functions. These additional information will be sent when establish TCP connection, or be insert into the front of data packet.

- Registration type: ICCID, MEID, CLOUD and USER
- ICCID: The unique identifier of SIM card, suitable to the application based on SIM card identification.
- MEID: The unique identifier of DTU, suitable to the application based on device identification, which has nothing to do with installed SIM card.
- CLOUD: The identification code based on USR CLOUD platform. By related parameters that have access permission can realize USR CLOUD function.
- USER: User defined data, suitable for user custom registration data.

3.4.2. Synchronize Baud Rate

This function is similar to RFC2217, that is to modify serial parameters from net side automatically. This modification is temporary, will restore original parameters after restart.

Protocol Instructions

Protocol length is 8 bytes, detailed protocol as follows, example in HEX:

Name	Packet header	Baud rate	Bit	Checksum
Byte quantity	3	3	1	1
Description	3 bytes, to reduce misjudgment	3 bytes mean a baudrate value, high bit in front	Different bit means differently, see below form	Checksum of the 4 bytes in front, ignore carry bit
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

UART Bit Instructions

Bit number	Instruction	Value	Description
1:0	Data bit selection	00	5
		01	6
		10	7
		11	8
2	Stop bit	0	1
		1	2
3	Check bit enable	0	disable
		1	enable
5:4	Check bit type	00	ODD
		01	EVEN
7:6	No definition	00	Pls write 0

3.4.3. Heartbeat Packet

In transparent transmission mode, module can send heartbeat packet. Heartbeat packet can be sent to both net server and serial device. The main purpose sending to net side is to keep connection with server, and for these idle modules (not send data to server for a long time) to check if the connection status is valid. When connection is abnormal, module detected unable to send heartbeat packet to server. If sending failed more than 3 times, module will judge the connection abnormal and try to connect to server again. We suggest setting this function ON.

In the application of server sending fixed query command to device, to reduce the traffic, user can choose to send heartbeat packet(query command) to serial device instead of send query command from the server.

3.4.4. Indicator Light

The status indicator light of USR-G760c: POWER,WORK, STA, LINKA, LINKB

- POWER: Keep ON, normal; OFF, abnormal.
- WORK: Blink, normal; OFF, abnormal.
- STA: This indicate the module working status. Keep ON after startup; Blink when connect with network.
- LINKA: This indicate the connection status of socket A. Keep ON when connecting; get OFF when disconnect.
- LINKB: This indicate the connection status of socket B. Keep ON when connecting; get OFF when disconnect.

3.4.5. Reload by Hardware

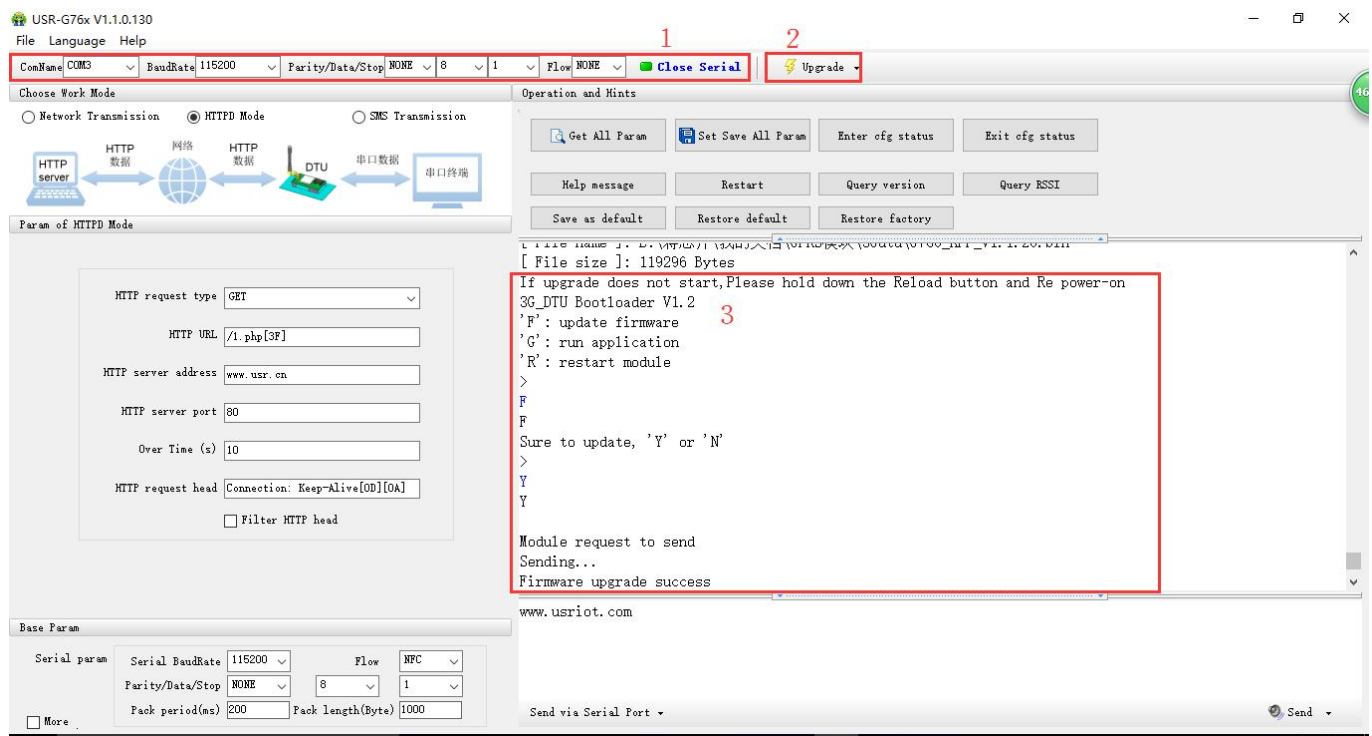
By reload button, USR-G760c restore factory defaults or user set parameters

- Reload to user default settings: Power on, press Reload button for 1-3s and release.
- Reload to factory defaults: Power on, press Reload more than 6s and release.

3.4.6. Firmware Upgrade

Connect USR-G760c with PC by USB-RS232 cable, make sure the USR-G760c power is off now.

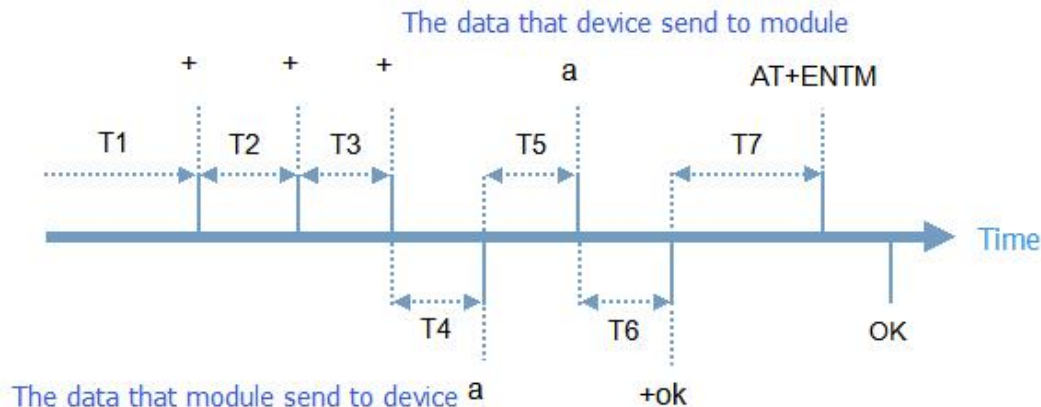
1. Open setup software “USR-G760 USR-G760 V1.0.0.392” or higher version, us default UART parameters, select correct COM and click “Open Serial”
2. Click “Upgrade”, select correct firmware in the pop-up window
3. It shows “F,G,R” information in the software.
4. Press Reload button, power on USR-G760c, it will begin download firmware process, now release the reload button. Until download finished, power off the USR-G760c. Then power on again.



4. AT Command

4.1. Switch Command Mode

When module working in SMS transparent transmission mode, network transparent transmission mode or HTTPD Client mode, it can switch to “AT command mode” by sending specific time-series data to serial port. Also it can return to previous working mode by sending specific commands.



In above picture, abscissa axis is the timeline. Data on the above is send from device to module, data under it is send from module to device.

Time requirement:

$T1 > 200\text{ms}$

$T2 < 50\text{ms}$

$T3 < 50\text{ms}$

$T5 < 3\text{s}$

The time series for switch to “AT command mode”:

- Serial device send “+++” to module. Module will reply an “a” after receiving “+++”. Before sending “+++”, for 200ms, can NOT send any data.
- Serial device need to send an “a” to module after receiving the “a”.
- Module will reply “+ok” to device after receiving the “a” and get into “temporary command mode”.
- When device receive “+ok”, it knows the module is on “temporary command mode”, then it can send AT command to module.

The time series for switch to previous mode:

- Serial device send “AT+ENTM” to module.
- Module send “OK” after receiving “AT+ENTM” and get into previous mode.
- Device will know module get back to previous work mode when receiving “OK”

4.2. Command Format

The AT command is “Query & Response” format, contains “Query” and “Response” parts. “Query” is to send AT command, “Response” is to reply information.

<Note>

The characters in command are not case-sensitive.

4.2.1. Symbol Description:

<>	Contents included is required
[]	Contents included is non-essential
{ }	Contents included is string with particular meaning in this manual
~	Parameter range, example: A~B, range from A to B
CMD	Command code
OP	Operater
PARA	Parameter
CR	“Carriage Return” of ASCII code, expressed as 0x0D in hexadecimal number
LF	“Line Feed” of ASCII code, expressed as 0x0A in hexadecimal number

4.2.2. The Format of “Query” in Commands

Command string: <AT+>[CMD][OP][PARA]<CR>

Command code	Defination	Essential or not
AT+	AT command head	Y
CMD	Function property of command	Y
OP	Operate code, such as=, ?, =?	N
PARA	Parameter of execution	N
CR	Carriage return, command terminator	Y

Description of command type:

Type	Command string format	Instruction
0	<AT+><CMD>?<CR>	Execute command or query current parameter
1	<AT+><CMD>=?<CR>	Query the range/type of parameters in the command
2	<AT+><CMD><CR>	Execute command or query current parameter value
3	<AT+><CMD>=<PARA><CR>	Set the parameter values for the command

4.2.3. The Format of “Response” in Commands

<Note>

There are 2 kinds of response information in commands: with echo and without echo.

- With echo: When input commands, module will return the inputted contents, then response to the command.
- Without echo: Module will not return the inputted contents, just response to command.

Following instructions are without echo for examples:

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

Command code	Defination	Essential or not
CR	Carriage return	N
LF	Line feed	N
+CMD	Response header	N
OP	Operater, such as:	N
PARA	The returned parameter	N
CR	Carriage return	N
LF	Line feed	N
CR	Carriage return	Y
LF	Line feed	Y
OK	Expressed operation succeed	N
CR	Carriage return	Y
LF	Line feed	Y

Description of returned command type

Type	Command string format	Instruction
0	<CR><LF><OK><CR><LF>	Return command succeed
1	<CR><LF><+CMD:><PARA><CR><LF><CR><LF><OK><CR><LF>	Return current parameter

4.2.4. Specific Symbol Instructions

In AT command, these are specific symbols:

=	,	?	CR	LF
---	---	---	----	----

Parameters can't include these sumbols drectly, user need to escape in advance.

Escape regulation: use [] to enclose the HEX of specific symbols, means input an ASCII code which is

expressed by HEX code.

Example: the HEX code of ? is 0x3F, according to the escape regulation, it is expressed by [3F]

4.3. AT Instruction Set

Command	Function description
Executive instruction	
AT	Test instruction
H	Help
Z	Restart
E	Query/Set whether open instruction echo
ENTM	Exit command mode
WKMOD	Query/Set work mode
CMDPW	Query/Set command password
STMSG	Query/Set module start information
Configure parameter instruction	
RELD	Reload to user default settings
CLEAR	Reload to factory defaults
CFGTF	Save current parameters as default settings
Information query instruction	
VER	Query version
SN	Query SN code
ICCID	Query ICCID code
MEID	Query MEID code
Serial port parameter instruction	
UART	Query/Set UART parameters
UARTFT	Query/Set UART packet time interval
UARTFL	Query/Set UART packet length
RFCEN	Query/Set whether support class RFC2217 function
Network instructions	
APN	Query/Set APN information
SOCKA	Query/Set socket A parameter
SOCKB	Query/Set socket B parameter
SOCKAEN	Query/Set whether enable socket A
SOCKBEN	Query/Set whether enable socket B
SOCKASL	Query/Set whether enable socket A short connection
SOCKBSL	Query/Set whether enable socket B short connection
SOCKALK	Query link status of socket A
SOCKBLK	Query link status of socket B
SOCKATO	Query/Set timeout of socket A short connection
SOCKBTO	Query/Set timeout of socket B short connection
Registration packet instruction	

REGEN	Query/Set whether enable registration packet
REGTP	Query/Set the type of registration packet contents
REGID	Query/Set registration ID (for D2D application)
REGDT	Query/Set custom registration information
REGSND	Query/Set send type of registration packet
CLOUD	Query/Set registration parameters of cloud
Heartbeat instruction	
HEARTEN	Query/Set whether enable heartbeat packet
HEARTDT	Query/Set data of heartbeat packet
HEARTTP	Query/Set send type of heartbeat packet
HEARTTM	Query/Set time interval of heartbeat packet
HTTPD instruction	
HTPTP	Query/Set HTTP work mode
HTPURL	Query/Set URL
HTPSV	Query/Set destination server IP and Port
HTPHD	Query/Set HEAD information of HTTP protocol
HTPTO	Query/Set timeout time
HTPFLT	Query/Set whether enable filtering packet header
SMS instruction	
DSTNUM	Destination phone number
SMSSEND	Send SMS
CISMSEND	Send SMS
SMSFLT	Query/Set whether enable filtering SMS source number

4.4. AT Instructions

4.4.1. AT

- Function: Test command, used to test whether current device is active
- Format:
 - ◆ Query:


```
AT+H{CR}
{CR}{LF}OK{CR}{LF}{CR}{LF}OK{CR}{LF}
```

4.4.2. AT+H

- Function: help command
- Format:
 - ◆ Query:


```
AT+H{CR}
{CR}{LF}help message{CR}{LF}{CR}{LF}OK{CR}{LF}
```
- Parameters:

- ◆ help message: help instructions

4.4.3. AT+Z

- Function: reset
- Format:
 - AT+Z{CR}
 - {CR}{LF}OK{CR}{LF}

4.4.4. AT+E

- Function: Query/Set the echo status of device AT command
- Format:
 - ◆ Query current parameter values:
 - AT+E{CR} or AT+E?{CR}
 - {CR}{LF}+E:status{CR}{LF}{CR}{LF}OK{CR}{LF}
 - ◆ Set:
 - AT+E=status{CR}
 - {CR}{LF}OK{CR}{LF}
- Parameters:
 - ◆ Status: echo status, include:
 - ✧ “on”: open
 - ✧ “off”: close

4.4.5. AT+ENTM

- Function: set device back to previous work mode
- Format:
 - ◆ Execute specified function:
 - AT+ENTM{CR}
 - {CR}{LF}OK{CR}{LF}

4.4.6. AT+WKMOD

- Function: Query/Set device work mode
- Format:
 - ◆ Query current parameter values:
 - AT+WKMOD{CR} or AT+WKMOD?{CR}
 - {CR}{LF}+WKMOD:mode{CR}{LF}{CR}{LF}OK{CR}{LF}
 - ◆ Set:
 - AT+WKMOD=mode{CR}
 - {CR}{LF}OK{CR}{LF}
- Parameters:

- ◆ mode: work mode, including:
 - ◇ “SMS”: SMS transparent transmission mode
 - ◇ “NET”: network transparent transmission mode
 - ◇ “HTTPD”: HTTPD mode

4.4.7. AT+CMDPW

- Function: Query/Set password
- Format:
 - ◆ Query current parameter values:
AT+CMDPW{CR} or AT+CMDPW?{CR}
{CR}{LF}+CMDPW:password{CR}{LF}{CR}{LF}OK{CR}{LF}
 - ◆ Set:
AT+CMDPW=password{CR}
{CR}{LF}OK{CR}{LF}
- Parameters:
 - ◆ password: command password, ASCII code that in 1~10 bytes

4.4.8. AT+STMSG

- Function: Query/Set device hello message
- Format:
 - ◆ Query current parameter values:
AT+STMSG{CR} or AT+STMSG?{CR}
{CR}{LF}+STMSG:message{CR}{LF}{CR}{LF}OK{CR}{LF}
 - ◆ Set:
AT+STMSG=message{CR}
{CR}{LF}OK{CR}{LF}
- Parameters:
 - ◆ message: hello message. The message that will output automatically after power on. ASCII code that in 1~20 bytes.

4.4.9. AT+CSQ

- Function: Query current signal strength information of device
- Format:
 - ◆ Query current parameter values:
AT+CSQ{CR} or AT+CSQ?{CR}
{CR}{LF}+CSQ: rssi,ber {CR}{LF}{CR}{LF}OK{CR}{LF}
- Parameters:
 - ◆ rssi: received signal strength indicator
 - ◇ 0, equal to or less than 125 dBm
 - ◇ 1~30, round numbers $(31 \times (125 - |rssi|) / 50)$ dBm

- ✧ 31, equal to or greater than -75 dBm
- ✧ 99, unknown or unpredictable
- ◆ ber: (bit error rate percentage), don't support BER query at present, will respond 99 in Execution command and Test command

4.4.10. AT+RELD

- Function: Reload to user default settings, device will restart
- Format:
 - ◆ Execute specified function
AT+RELD{CR}
{CR}{LF}OK{CR}{LF}

4.4.11. AT+CLEAR

- Function: Reload to factory defaults, device will restart
- Format:
 - ◆ Execute specified function
AT+CLEAR{CR}
{CR}{LF}OK{CR}{LF}

4.4.12. AT+CFGTF

- Function: Save current operation parameters to be default settings
- Format:
 - ◆ Execute specified function:
AT+CFGTF{CR}
{CR}{LF}OK{CR}{LF}

4.4.13. AT+VER

- Function: Query firmware version
- Format:
 - ◆ Query current parameter values:
AT+VER{CR} or AT+VER?{CR}
{CR}{LF}+VER:version{CR}{LF}{CR}{LF}OK{CR}{LF}
- Parameters:
 - ◆ version: firmware version number

4.4.14. AT+SN

- Function: Query SN code
- Format:

- ◆ Query current parameter values:
AT+SN{CR} or AT+SN?{CR}
{CR}{LF}+SN:code{CR}{LF}{CR}{LF}OK{CR}{LF}
- Parameters:
 - ◆ code: SN code

4.4.15. AT+ICCID

- Function: Query ICCID code
- Format:
 - ◆ Query current parameter values:
AT+ICCID{CR} or AT+ICCID?{CR}
{CR}{LF}+ICCID:code{CR}{LF}{CR}{LF}OK{CR}{LF}
- Parameters:
 - ◆ code: ICCID code

4.4.16. AT+MEID

- Function: Query IMEI code
- Format:
 - ◆ Query current parameter values:
AT+MEID{CR} or AT+MEID?{CR}
{CR}{LF}+MEID:code{CR}{LF}{CR}{LF}OK{CR}{LF}
- Parameters:
 - ◆ code: MEID code

4.4.17. AT+UART

- Function: Query/Set UART parameters
- Format:
 - AT+UART{CR} or AT+UART?{CR}
{CR}{LF}+UART:baud,data bit,stop bit,parity,flow control{CR}{LF}{CR}{LF}OK{CR}{LF}
 - ◆ Set:
AT+UART=baud,data bit,stop bit,parity,flow control{CR}
{CR}{LF}OK{CR}{LF}
- Parameters:
 - ◆ baud: baud rate, continus value range from 1200~460800
 - ◆ data bit, including:
 - ◇ 5: 5
 - ◇ 6: 6
 - ◇ 7: 7
 - ◇ 8: 8
 - ◆ stop bit, including:

- ◇ 1: 1
- ◇ 2: 2
- ◆ parity: check bit, including:
 - ◇ "NONE"
 - ◇ "ODD"
 - ◇ "EVEN"
- ◆ flow control, including
 - ◇ "NONE"
 - ◇ "RS485": enable RS485 function

4.4.18. AT+UARTFT

- Function: Query/Set UART packet interval time
- Format:
 - AT+UARTFT{CR} or AT+UARTFT?{CR}
 - {CR}{LF}+UARTFT:time{CR}{LF}{CR}{LF}OK{CR}{LF}
- ◆ Set:
 - AT+UARTFT=time{CR}
 - {CR}{LF}OK{CR}{LF}
- Parameters:
 - ◆ time: packet interval time, range from 50~60000ms, pls refer to chapter 3.3

4.4.19. AT+UARTFL

- Function: Query/Set UART packet length
- Format:
 - AT+UARTFL{CR} or AT+UARTFL?{CR}
 - {CR}{LF}+UARTFL:length{CR}{LF}{CR}{LF}OK{CR}{LF}
- ◆ Set:
 - AT+UARTFL=length{CR}
 - {CR}{LF}OK{CR}{LF}
- Parameters:
 - ◆ length: packet length, range from 1~1000 bytes, pls refer to chapter 3.3

4.4.20. AT+RFCEN

- Function: Query/Set whether enable the analogous RFC2217 function
- Format:
 - ◆ Query current parameter values:
 - AT+RFCEN{CR} or AT+RFCEN?{CR}
 - {CR}{LF}+RFCEN:status{CR}{LF}{CR}{LF}OK{CR}{LF}
 - ◆ Set:
 - AT+RFCEN=status{CR}

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

- Parameters:
 - ◆ status: status of analogous RFC2217 function, including
 - ◇ “on”: enable
 - ◇ “off”: disable

4.4.21. AT+APN

- Function: Query/Set APN code
- Format:
 - ◆ Query current parameter values:
AT+APN{CR} or AT+APN?{CR}
{CR}{LF}+APN:code{CR}{LF}{CR}{LF}OK{CR}{LF}
 - ◆ Set:
AT+APN=code{CR}
{CR}{LF}OK{CR}{LF}
- Parameters:
 - ◆ code: APN code

4.4.22. AT+SOCKA

- Function: Query/Set parameters of socket A
- Format:
 - ◆ Query current parameter values:
AT+SOCKA{CR} or AT+SOCKA?{CR}
{CR}{LF}+SOCKA:protocol,address,port{CR}{LF}{CR}{LF}OK{CR}{LF}
 - ◆ Set:
AT+SOCKA=protocol,address,port{CR}
{CR}{LF}OK{CR}{LF}
- Parameters:
 - ◆ protocol, including:
 - ◇ “TCP”
 - ◇ “UDP”
 - ◆ address: destination server address, the address can be domain name or IP address
 - ◆ port: destination server port, range from 1~65535

4.4.23. AT+SOCKB

- Function: Query/Set parameters of socket B
- Format:
 - ◆ Query current parameter values:
AT+SOCKB{CR} or AT+SOCKB?{CR}
{CR}{LF}+SOCKB:protocol,address,port{CR}{LF}{CR}{LF}OK{CR}{LF}

- ◆ Set:
AT+SOCKB=protocol,address,port{CR}
{CR}{LF}OK{CR}{LF}
- Parameters:
 - ◆ protocol, including:
 - ◇ “TCP”
 - ◇ “UDP”
 - ◆ address: destination server address, the address can be domain name or IP address
 - ◆ port: destination server port, range from 1~65535

4.4.24. AT+SOCKAEN

- Function: Query/Set whether enable socket A
- Format:
 - ◆ Query current parameter values:
AT+SOCKAEN{CR} or AT+SOCKAEN?{CR}
{CR}{LF}+SOCKAEN:status{CR}{LF}{CR}{LF}OK{CR}{LF}
 - ◆ Set:
AT+SOCKAEN=status{CR}
{CR}{LF}OK{CR}{LF}
- Parameters:
 - ◆ status: status of socket A, including:
 - ◇ “on”: enable
 - ◇ “off”: disable

4.4.25. AT+SOCKBEN

- Function: Query/Set whether enable socket B
- Format:
 - ◆ Query current parameter values:
AT+SOCKBEN{CR} or AT+SOCKBEN?{CR}
{CR}{LF}+SOCKBEN:status{CR}{LF}{CR}{LF}OK{CR}{LF}
 - ◆ Set:
AT+SOCKBEN=status{CR}
{CR}{LF}OK{CR}{LF}
- Parameters:
 - ◆ status: status of socket B, including:
 - ◇ “on”: enable
 - ◇ “off”: disable

4.4.26. AT+SOCKASL

- Function: Query/Set the link type in transmission of socket A

- Format:
 - ◆ Query current parameter values:
AT+SOCKASL{CR} or AT+SOCKASL?{CR}
{CR}{LF}+SOCKASL:type{CR}{LF}{CR}{LF}OK{CR}{LF}
 - ◆ Set:
AT+SOCKASL=type{CR}
{CR}{LF}OK{CR}{LF}
- Parameters:
 - ◆ type: link type including:
 - ✧ “short”: short link
 - ✧ “long”: long link

4.4.27. AT+SOCKBSL

- Function: Query/Set the link type in transmission of socket B
- Format:
 - ◆ Query current parameter values:
AT+SOCKBSL{CR} or AT+SOCKBSL?{CR}
{CR}{LF}+SOCKBSL:type{CR}{LF}{CR}{LF}OK{CR}{LF}
 - ◆ Set:
AT+SOCKBSL=type{CR}
{CR}{LF}OK{CR}{LF}
- Parameters:
 - ◆ type: link type including:
 - ✧ “short”: short link
 - ✧ “long”: long link

4.4.28. AT+SOCKALK

- Function: Query whether socket A link established
- Format:
 - ◆ Query current parameter values:
AT+SOCKALK{CR} or AT+SOCKALK?{CR}
{CR}{LF}+SOCKALK:status{CR}{LF}{CR}{LF}OK{CR}{LF}
- Parameters:
 - ◆ status: link status of socket A, including:
 - ✧ “on”: connect
 - ✧ “off”: disconnect

4.4.29. AT+SOCKBLK

- Function: Query whether socket B link established
- Format:

- ◆ Query current parameter values:
AT+SOCKBLK{CR} or AT+SOCKBLK?{CR}
{CR}{LF}+SOCKBLK:status{CR}{LF}{CR}{LF}OK{CR}{LF}
- Parameters:
 - ◆ status: link status of socket B, including:
 - ✧ “on”: connect
 - ✧ “off”: disconnect

4.4.30. AT+SOCKATO

- Function: Query/Set the time out of socket A short link
- Format:
 - ◆ Query current parameter values:
AT+SOCKATO{CR} or AT+SOCKATO?{CR}
{CR}{LF}+SOCKATO:time{CR}{LF}{CR}{LF}OK{CR}{LF}
- Parameters:
 - ◆ time: timeout of socket A short link, range from 1~100s

4.4.31. AT+SOCKBTO

- Function: Query/Set the time out of socket B short link
- Format:
 - ◆ Query current parameter values:
AT+SOCKBTO{CR} or AT+SOCKBTO?{CR}
{CR}{LF}+SOCKBTO:time{CR}{LF}{CR}{LF}OK{CR}{LF}
- Parameters:
 - ◆ time: timeout of socket A short link, range from 1~100s

4.4.32. AT+SOCKIND

- Function: Query/Set whether enable indicate which socket is data from
- Format:
 - ◆ Query current parameter values:
AT+SOCKIND{CR} or AT+SOCKIND?{CR}
{CR}{LF}+SOCKIND:status{CR}{LF}{CR}{LF}OK{CR}{LF}
 - ◆ Set:
AT+SOCKIND=status{CR}
{CR}{LF}OK{CR}{LF}
- Parameters:
 - ◆ status: function of indicating which socket is data from, including:
 - ✧ “on”: open
 - ✧ “off”: close

4.4.33. AT+REGEN

- Function: Query/Set whether enable registration packet function
- Format:
 - ◆ Query current parameter values:
AT+REGEN{CR} or AT+REGEN?{CR}
{CR}{LF}+REGEN:status{CR}{LF}{CR}{LF}OK{CR}{LF}
 - ◆ Set:
AT+REGEN=status{CR}
{CR}{LF}OK{CR}{LF}
- Parameters:
 - ◆ status: status of registration packet, including:
 - ✧ “on”: open
 - ✧ “off”: close

4.4.34. AT+REGTP

- Function: Query/Set the type of registration packet
- Format:
 - ◆ Query current parameter values:
AT+REGTP{CR} or AT+REGTP?{CR}
{CR}{LF}+REGTP:type{CR}{LF}{CR}{LF}OK{CR}{LF}
 - ◆ Set:
AT+REGTP=type{CR}
{CR}{LF}OK{CR}{LF}
- Parameters:
 - ◆ type: type of registration packet, including:
 - ✧ “ICCID”: ICCID code
 - ✧ “MEID”: MEID code
 - ✧ “D2DID”: resister ID of D2D function
 - ✧ “CLOUD”: cloud function
 - ✧ “USER”: user defined

4.4.35. AT+REGID

- Function: Query/Set registration ID
- Format:
 - ◆ Query current parameter values:
AT+REGID{CR} or AT+REGID?{CR}
{CR}{LF}+REGID:id{CR}{LF}{CR}{LF}OK{CR}{LF}
 - ◆ Set:
AT+REGID=id{CR}
{CR}{LF}OK{CR}{LF}
- Parameters:

- ◆ id: registration ID of D2Dfunction, range from 1~65536

4.4.36. AT+REGDT

- Function: Query/Set data of defined registration packet
- Format:
 - ◆ Query current parameter values:
AT+REGDT{CR} or AT+REGDT?{CR}
{CR}{LF}+REGDT:data{CR}{LF}{CR}{LF}OK{CR}{LF}
 - ◆ Set:
AT+REGDT=data{CR}
{CR}{LF}OK{CR}{LF}
- Parameters:
 - ◆ data: user defined registration data, in HEX, max 80 bytes.
Example: parameter value is "7777772E7573722E636E", shown in ASCII code is "www.usr.cn"

4.4.37. AT+REGSND

- Function: Query/Set send type of registration packet
- Format:
 - ◆ Query current parameter values:
AT+REGSND{CR} or AT+REGSND?{CR}
{CR}{LF}+REGSND:type{CR}{LF}{CR}{LF}OK{CR}{LF}
 - ◆ Set:
AT+REGSND=type{CR}
{CR}{LF}OK{CR}{LF}
- Parameters:
 - ◆ type: send type, including:
 - ✧ "link": send when link established
 - ✧ "data": registration packet as the header of each data packet

4.4.38. AT+CLOUD

- Function: Query/Set registration parameters of USR cloud function
- Format:
 - ◆ Query current parameter values:
AT+CLOUD{CR} or AT+CLOUD?{CR}
{CR}{LF}+CLOUD:id,password{CR}{LF}{CR}{LF}OK{CR}{LF}
 - ◆ Set:
AT+CLOUD=id,password{CR}
{CR}{LF}OK{CR}{LF}
- Parameters:
 - ◆ id: registration ID of USR cloud function, length is 20 bytes

- ◆ password: password of USR cloud function, length is 8 bytes

4.4.39. AT+HEARTEN

- Function: Query/Set whether enable heartbeat packet function
- Format:
 - ◆ Query current parameter values:
AT+HEARTEN{CR} or AT+HEARTEN?{CR}
{CR}{LF}+HEARTEN:status{CR}{LF}{CR}{LF}OK{CR}{LF}
 - ◆ Set:
AT+HEARTEN=status{CR}
{CR}{LF}OK{CR}{LF}
- Parameters:
 - ◆ status: status of heartbeat packet, including:
 - ✧ “on”: open
 - ✧ “off”: close

4.4.40. AT+HEARTDT

- Function: Query/Set heartbeat packet data
- Format:
 - ◆ Query current parameter values:
AT+HEARTDT{CR} or AT+HEARTDT?{CR}
{CR}{LF}+HEARTDT:data{CR}{LF}{CR}{LF}OK{CR}{LF}
 - ◆ Set:
AT+HEARTDT=data{CR}
{CR}{LF}OK{CR}{LF}
- Parameters:
 - ◆ data: heartbeat packet data, in HEX, 2~80 (even number) bytes
Example: parameter value is “7777772E7573722E636E”, shown in ASCII code is “www.usr.cn”

4.4.41. AT+HEARTTP

- Function: Query/Set send type of heartbeat packet
- Format:
 - ◆ Query current parameter values:
AT+HEARTTP{CR} or AT+HEARTTP?{CR}
{CR}{LF}+HEARTTP:type{CR}{LF}{CR}{LF}OK{CR}{LF}
 - ◆ Set:
AT+HEARTTP=type{CR}
{CR}{LF}OK{CR}{LF}
- Parameters:
 - ◆ type: send type, including:

- ✧ “COM”: send heartbeat packet to COM
- ✧ “NET”: send heartbeat packet to NET

4.4.42. AT+HEARTTM

- Function: Query/Set time interval of sending heartbeat packet
- Format:
 - ◆ Query current parameter values:
AT+HEARTTM{CR} or AT+HEARTTM?{CR}
{CR}{LF}+HEARTTM:time{CR}{LF}{CR}{LF}OK{CR}{LF}
 - ◆ Set:
AT+HEARTTM=time{CR}
{CR}{LF}OK{CR}{LF}
- Parameters:
 - ◆ time: time interval, range from 1~6000s

4.4.43. AT+HTPTP

- Function: Query/Set method of HTTP request
- Format:
 - ◆ Query current parameter values:
AT+HTPTP{CR} or AT+HTPTP?{CR}
{CR}{LF}+HTPTP:type{CR}{LF}{CR}{LF}OK{CR}{LF}
 - ◆ Set:
AT+HTPTP=type{CR}
{CR}{LF}OK{CR}{LF}
- Parameters:
 - ◆ type: method of HTTP request, including:
 - ✧ “GET”
 - ✧ “POST”

4.4.44. AT+HTPURL

- Function: Query/Set URL of HTTP request
- Format:
 - ◆ Query current parameter values:
AT+HTPURL{CR} or AT+HTPURL?{CR}
{CR}{LF}+HTPURL:URL{CR}{LF}{CR}{LF}OK{CR}{LF}
 - ◆ Set:
AT+HTPURL=URL{CR}
{CR}{LF}OK{CR}{LF}
- Parameters:
 - ◆ URL: URL of HTTP request, example /1.php[3F], escape regulation pls refer to chapter 4.2.4

4.4.45. AT+HTPSV

- Function: Query/Set server parameters of HTTP request
- Format:
 - ◆ Query current parameter values:
AT+HTPSV{CR} or AT+HTPSV?{CR}
{CR}{LF}+HTPSV:address,port{CR}{LF}{CR}{LF}OK{CR}{LF}
 - ◆ Set:
AT+HTPSV=address,port{CR}
{CR}{LF}OK{CR}{LF}
- Parameters:
 - ◆ address: server address, can be domain name or IP address
 - ◆ port: server port, range from 1~65535

4.4.46. AT+HTPHD

- Function: Query/Set head information of HTTP request
 - Format:
 - ◆ Query current parameter values:
AT+HTPHD{CR} or AT+HTPHD?{CR}
{CR}{LF}+HTPHD:head{CR}{LF}{CR}{LF}OK{CR}{LF}
 - ◆ Set:
AT+HTPHD=head{CR}
{CR}{LF}OK{CR}{LF}
 - Parameters:
 - ◆ head: head information of HTTP request
- Example:
Connection: Keep-Alive[0D][0A], must end with [0D][0A], escape regulation pls refer to chapter 4.2.4

4.4.47. AT+HTPTO

- Function: Query/Set timeout time of HTTP request
- Format:
 - ◆ Query current parameter values:
AT+HTPTO{CR} or AT+HTPTO?{CR}
{CR}{LF}+HTPTO:time{CR}{LF}{CR}{LF}OK{CR}{LF}
 - ◆ Set:
AT+HTPTO=time{CR}
{CR}{LF}OK{CR}{LF}
- Parameters:
 - ◆ time: timeout time of HTTP request, range from 1~600s

4.4.48. AT+HTPFLT

- Function: Query/Set whether filter the head information of HTTP request respond information
- Format:
 - ◆ Query current parameter values:
AT+HTPFLT{CR} or AT+HTPFLT?{CR}
{CR}{LF}+HTPFLT:status{CR}{LF}{CR}{LF}OK{CR}{LF}
 - ◆ Set:
AT+HTPFLT=status{CR}
{CR}{LF}OK{CR}{LF}
- Parameters:
 - ◆ status: whether filter head information of HTTP request respond information
 - ✧ “on”: open
 - ✧ “off”: close

4.4.49. AT+DSTNUM

- Function: Query/Set the destination phone number of SMS
- Format:
 - ◆ Query current parameter values:
AT+DSTNUM{CR} or AT+DSTNUM?{CR}
{CR}{LF}+DSTNUM:number{CR}{LF}{CR}{LF}OK{CR}{LF}
 - ◆ Set:
AT+DSTNUM=number{CR}
{CR}{LF}OK{CR}{LF}
- Parameters:
 - ◆ number: destination phone number in SMS transmission function

4.4.50. AT+SMSSEND

- Function: send SMS
- Format:
 - ◆ Set:
AT+SMSSEND=number,type,data{CR}
{CR}{LF}OK{CR}{LF}
- Parameters:
 - ◆ number: destination phone number of SMS
 - ◆ type: encode type, including:
 - ✧ 2: ASCII code, no compression
 - ✧ 3: UCS8, both English and Chinese
 - ◆ data: data of SMS

4.4.51. AT+CISMSEND

- Function: send SMS
- Format:
 - ◆ Set:
AT+CISMSEND=number,type,data{CR}
{CR}{LF}OK{CR}{LF}
- Parameters:
 - ◆ number: destination phone number of SMS
 - ◆ type: encode type, including:
 - ✧ 2: ASCII code, no compression
 - ✧ 3: UCS8, both English and Chinese
 - ◆ data: data of SMS

4.4.52. AT+SMSFLT

- Function: Query/Set whether filter SMS source phone number
- Format:
 - ◆ Query current parameter values:
AT+SMSFLT{CR} or AT+SMSFLT?{CR}
{CR}{LF}+SMSFLT:status{CR}{LF}{CR}{LF}OK{CR}{LF}
 - ◆ Set:
AT+SMSFLT=status{CR}
{CR}{LF}OK{CR}{LF}
- Parameters:
 - ◆ status: whether filter SMS source phone number
 - ✧ "on": open
 - ✧ "off": close

4.4.53. AT+SMSPH

- Function: Query/Set whether display SMS source phone number
- Format:
 - ◆ Query current parameter values:
AT+SMSPH{CR} or AT+SMSPH?{CR}
{CR}{LF}+SMSPH:status{CR}{LF}{CR}{LF}OK{CR}{LF}
 - ◆ Set:
AT+SMSPH=status{CR}
{CR}{LF}OK{CR}{LF}
- Parameters:
 - ◆ status: whether display SMS source phone number
 - ✧ "on": open
 - ✧ "off": close

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7. Update History

2015-12-04 Establish V1.0

2016-01-26 V1.0.5, firmware version V1.1.10

Improve networking processing mechanism

Add query current signal intensity function

Add indicate which socket the data came from

Add indicate which number the SMS came from

Modify Reloda button function, press 1~3s to user default settings, press more than 6s to restore factory defaults

2016-02-26 V1.1.0, firmware version V1.1.20

Perfect the stability for long-time networking

Add necessity instructions for heartbeat

Add CDMA2000 network, 450MHz, 800MHz, 1900MHz frequency instruction and order information