

USR-G761w User Manual

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Brief Introduction

USR-G761w is a 3G DTU which apply to WCDMA network, and support WCDMA/GSM, and support HSDPA (7.2Mbps) high speed downlink transmission and HSUPA(5.76Mbps) high speed uplink transmission. "Transparent transmission" is highly usability, user can easily and fast integrate it to their system, to realize data transmission based on WCDMA network.

Features

- Supports GSM/GPRS/EDGE and WCDMA/HSPA(band 1,2 and 5)
- Supports 2 connections online simultaneously, supports TCP and UDP
- Supports sending network identity package
- Supports sending heartbeat package data to network or serial port
- Supports setting DTU parameters via SMS
- Supports 3 work modes: SMS transparent transmission mode, Network transparent transmission mode and HTTPD mode
- Supports sending SMS in ASCII/UCS2 directly or via commands
- Automatic baud rate synchronization, can modify DTU serial parameters via network dynamically
- Supports 1 RS232 or RS485 (can't be used in the same time)

1. Get Start

Product link:

<http://www.usriot.com/p/3g-wcdma-modem-serial-rs232-rs485-wcdma/>

USR-G761w setting software, download address:

<http://www.usriot.com/usr-g76x-setup-software/>

For further Guide Line:

<http://www.usriot.com/usr-g761w-guide-line/>



Introduction

USR-G761 is a DTU can used in 3G WCDMA network, it can worked in WCDMA/GSM, support HSDPA(7.2Mbps) high speed downlink transmission, and HSUPA(5.6Mbps) high speed uplink. The kern of G761W is "transparent transmission", user can integrate it into their system easily to realise data transfer based on WCDMA network.

Picture 1 Download Page

If you have any question, please submit it back to customer center: <http://h.usriot.com>

1.1. DTU Application

1.1.1. Application Diagram

This module(DTU) is used to poll the serial device data or transfer serial data to network in the field. Apply to modbus device, SCADA system and so on.



Figure 1 Application diagram

1.1.2. Hardware Connection Diagram



Figure 2 Hardware connection

1.2. Module Default Parameters

Work mode	Transparent mode
Server Address	test.usr.cn
Server Port	2317
Serial Parameters	115200,8,1,None
Heartbeat Package	www.usr.cn

Figure 3 Default parameters

1.3. Basic Parameters

	Parameter	Index	
Wireless Parameters	Working Frequency	GSM/GPRS/EDGE Quad-band:	
	Receive Sensitivity	GSM850	<-108.5dBm
		EGSM900	<-108.5dBm
		DCS1800	<-108.7dBm
		PCS1900	<-108.7dBm
	Max. Transmitted Power	GSM850	33dBm±2dB
		EGSM900	33dBm±2dB
		DCS1800	30dBm±2dB
		PCS1900	30dBm±2dB
		GSM850(8PSK)	27dBm±3dB
EGSM900(8PSK)		27dBm±3dB	
DCS1800(8PSK)		26dBm±3dB	
PCS1900(8PSK)		26dBm±3dB	
WCDMA 2100		24dBm±1/-3dB	
WCDMA 1900	24dBm±1/-3dB		
WCAMA 850	24dBm±1/-3dB		
Data Width	Downstream:7.2Mbps Upstream:5.76Mbps		
Hardware Parameters	Data Interface	RS232:1200bps - 460800bps RS485:1200bps - 460800bps	
	Power Interface	Support 5.08-2 terminal and DC5.5*2.1 terminal	
	Working Voltage	DC 5V~24V	
	Working Current	Average current 200mA@12V	
	Working Temp.	-35℃~80℃	
	Storage Temp.	-45℃~90℃	
	Dimension	103 x 105 x 28mm	
	Software Parameters	Work Mode	Transparent Mode, SMS Mode and HTTPD Client Mode
Setting Command		AT+ Command Structure	
User Configuration Method		Setting Software and AT command	
Software Functions	DNS	Support	
	Transparent Mode	TCP Client or UDP Client	
	HTTP	HTTPD Client Mode	
	SMS Mode	ASCII/USC2	
	Heartbeat Data Package	Serial or Network	
	Baud rate synchronization	Support	
	Identity Package	Support user-defined, ICCID,IMEI, USR Cloud ID	

Figure 4 Basic parameters

1.4. Hardware Introductions

Below is the hardware interface schematic diagram of USR-G761w



Figure 5 hardware interface schematic diagram

1.5. Dimensions

Below is the dimension figure of USR-G761w:

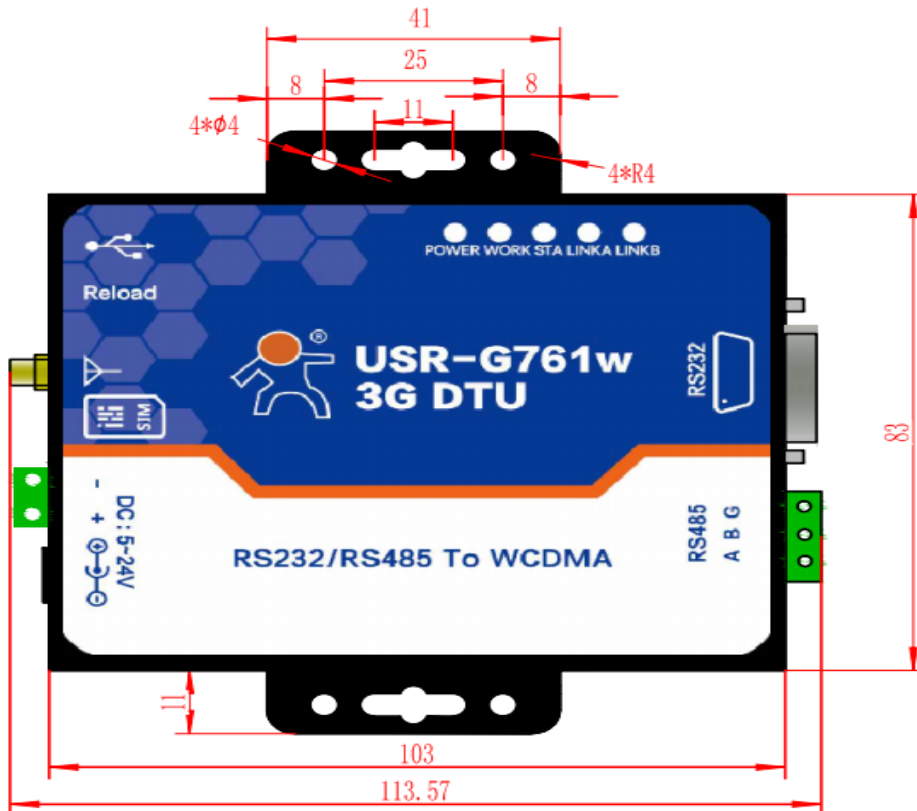


Figure 6 Dimension

2. Product Functions

This chapter introduces the functions of USR-G761w, as the following diagram shown, you can get an overall knowledge of it.

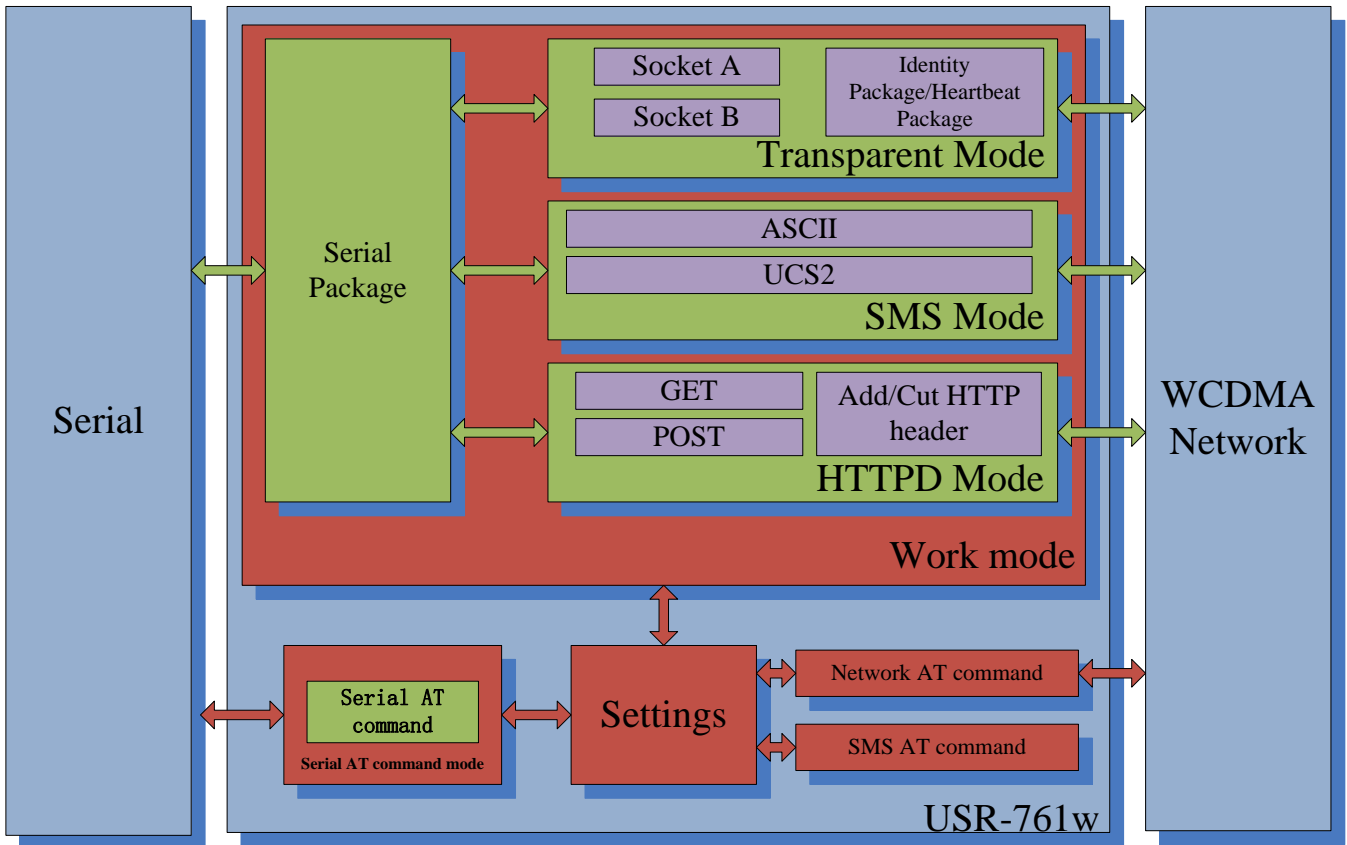


Figure 7 Software diagram

2.1. APN

Different operator have different APN(access point name), If you use the SIM card from the operator. You must know the APN. You can ask your SIM card operator for APN.

There are three parameters about APN. Those are APN, username and password. Sometimes only configure APN is enough.

2.2. Work Mode

2.2.1. Transparent Mode

Transparent Mode: What you sent to serial will be forward to network. The communication is bidirectional.

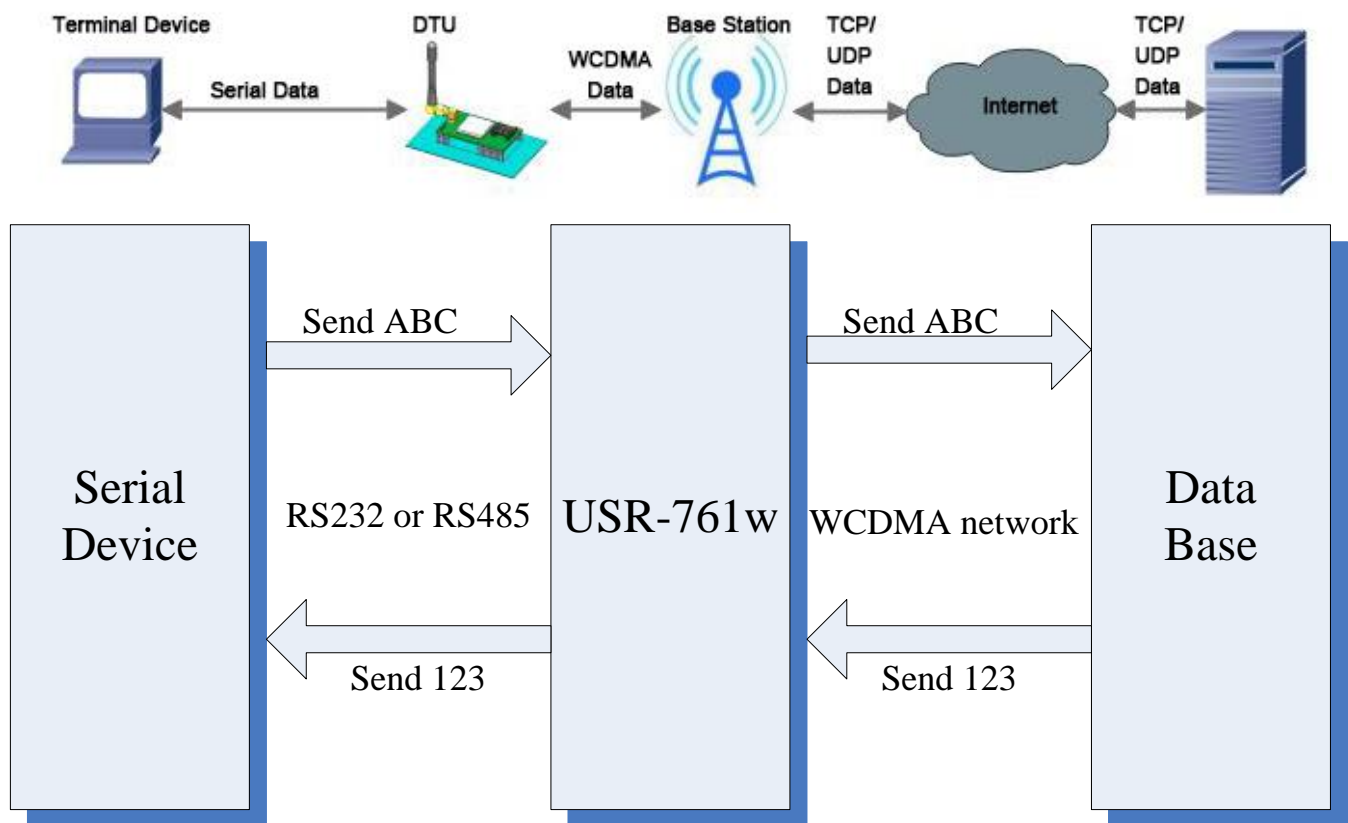


Figure 8 Transparent mode diagram

<Illustration>:

USR-G761w supports 2 socket connections simultaneously: socket A and socket B, they are independent. This DTU only support working as TCP Client and UDP Client.

2.2.2. HTTPD Client Mode

HTTPD Client Mode: DTU will add the HTTP Header for every data from serial and transfer HTTP format data to Network. User needs to configure the HTTP Header before use this mode. User can use this mode transfer the serial data to HTTP server.

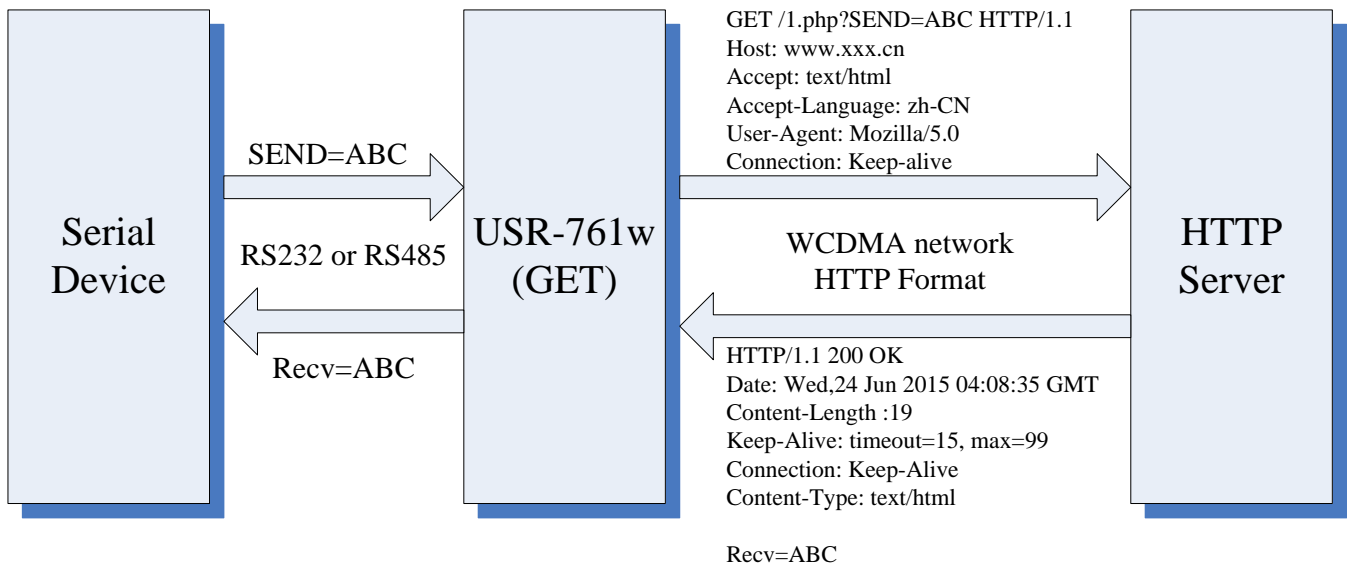
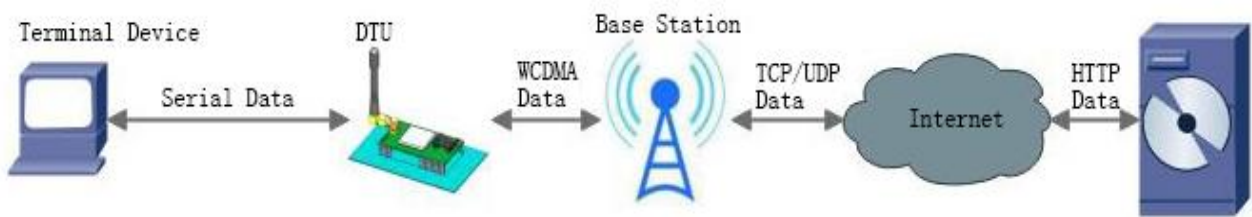


Figure 9 HTTPD Client Mode Diagram

<Note>:

DTU can't work as HTTP server.

2.2.3. SMS Mode

SMS Mode: Send serial data to mobile as SMS. This mode support ASCII and UCS2 format.

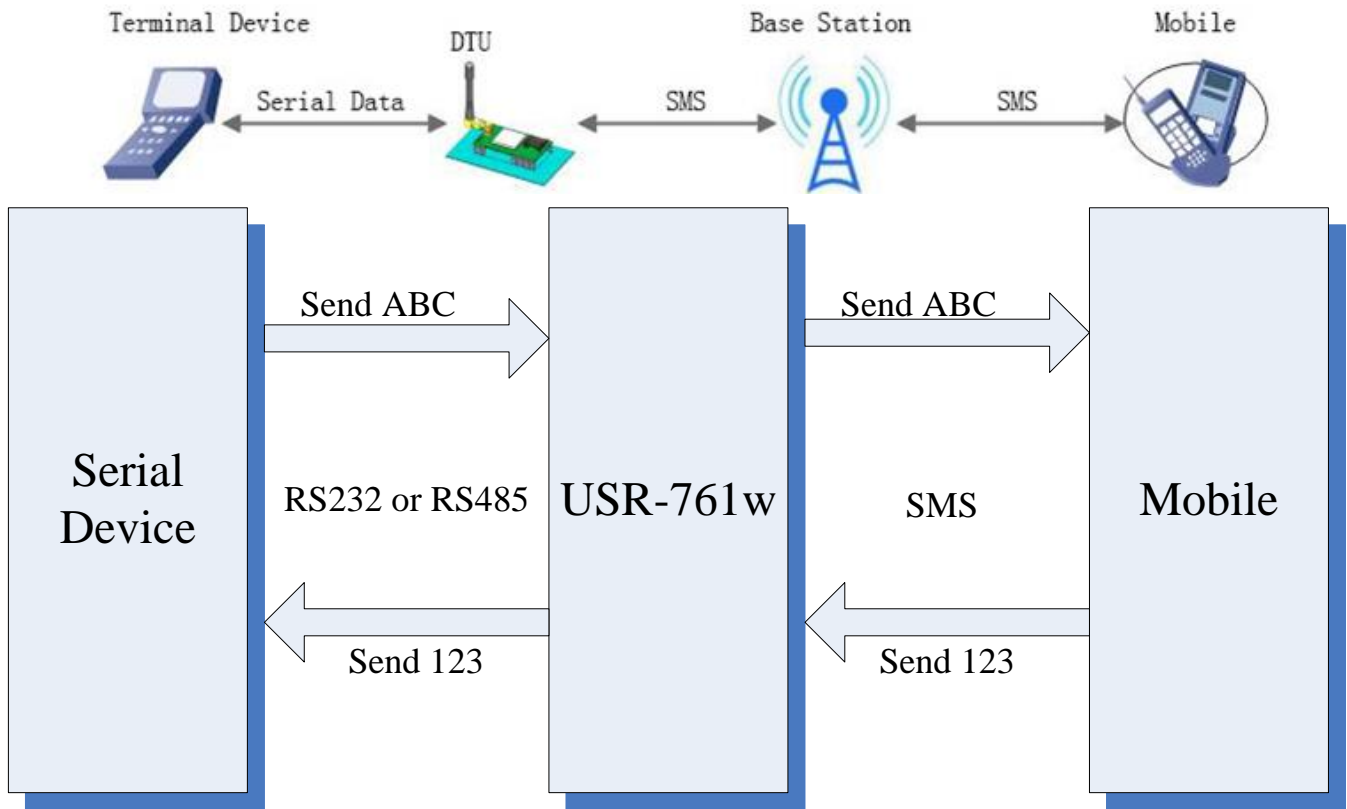


Figure 10 SMS Mode Diagram

2.3. Serial Port

2.3.1. Parameters range

Items	Parameters
Baud Rate	1200,2400,4800,9600,14400,19200,38400,57600,115200,12800 0,230400,460800
Data Bits	7,8
Stop Bits	1,2
Parity	NONE EVEN ODD SPACE
Flow Control/485	NFC: None Flow Control 485:When you use RS485, please choose this function

Figure 11 Serial parameters

2.3.2. Serial Package Methods

For network speed is faster than serial. Module will put serial data in buffer before sending it to network. The data will be sent to Network as Package. There are 2 ways to end the package and send package to network - Time and Length.

2.3.2.1. Time Trigger Mode

If no data get from serial over the time threshold, it will end the package and send this package to network. The range of threshold is from 10ms ~ 60000ms. Default is 200ms. If the serial keeping send data, this package will be 1K bytes.

2.3.2.2. Length Trigger Mode

The package will be sent to network when it up to length threshold. The range of length threshold is from 1 to 1024 bytes. Default is 1024 bytes.

2.3.3. RS485

RS485 transfer time: For RS485 is half-duplex. It needs time to switch the status between sending & receiving.

Switching period instructions:

- Receiving to sending: fixed switching period 5ms
- Sending to receiving:

$$T=N*10000/B + 10 \text{ (unit ms)}$$

T: The time taken from sending first byte to finish last byte. Note: it will switch to receiving status after finishing last byte

N: Number of sending bytes

B: Baud rate

2.3.4. Baud Rate Synchronization

This function is similar to RFC2217. When module works with USR devices or software, serial parameter will change dynamically according to network protocol. Customer can modify serial parameter by sending data conformed to specific protocol via network. It is temporary, when restart DTU, the parameters back to original parameters.

2.4. Features

2.4.1. Identity Package Function

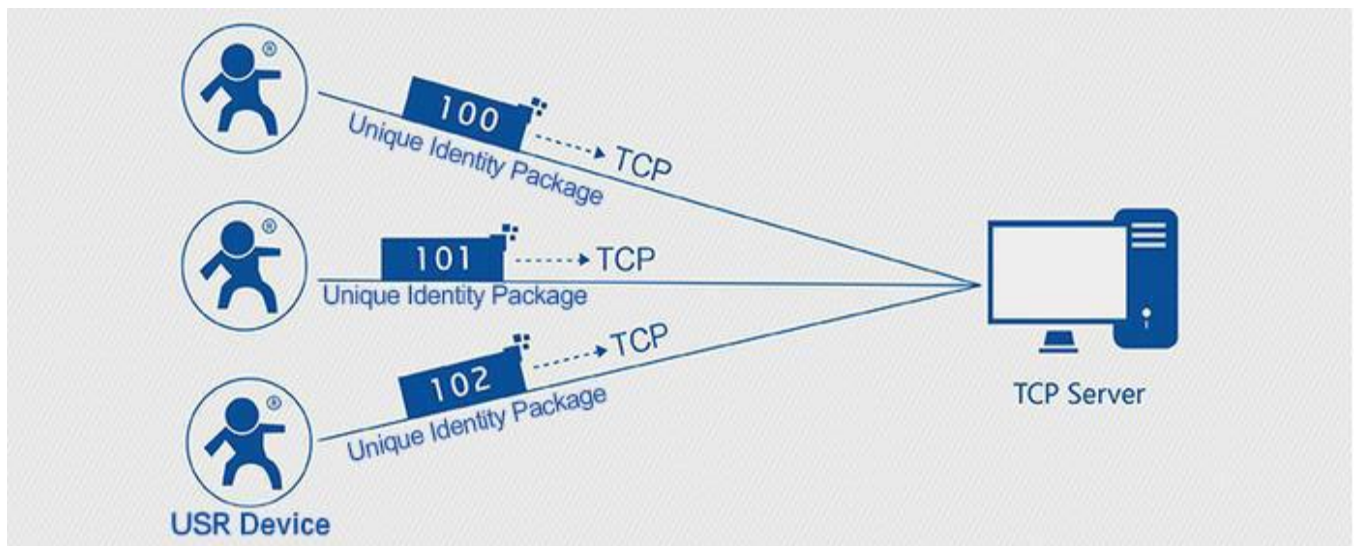


Figure 12 Identity Package

Identity Package is used for identify the device when module works as TCP client/UDP client. There are two methods for identity Package.

- Identity data will be sent when connection is established. (Only for TCP client)
- Identity data will be add on the front of every data package. (TCP client and UDP client)

Type of identity data: ICCID, IMEI, CLOUD and USER.

- ICCID, the unique identifier of SIM card, suitable to the application based on SIM card identification.
- IMEI, the unique identifier of DTU, suitable to the application based on device identification.
- CLOUD, the identification code based on USR CLOUD platform. For more information about USR Cloud, please go to cloud.usr.cn/en/

- USER, You can use your own identity data.

2.4.2. Heartbeat Package Function

Heartbeat Package: Module will output heartbeat data to serial or network periodic. User can configure the heartbeat data and time interval. Serial heartbeat data can be used for polling Modbus data. Network heartbeat data can be used for showing connection status and keep the connection.

Heartbeat Package is only in transparent mode.

2.4.3. LED Indicator

LED Indicators of USR-G761w are POWER, WORK, STA, LINKA and LINKB.

LED NAME	LED Status	Module Status
POWER	ON	Power ON
	OFF	Power OFF
WORK	ON	Working
	OFF	Not working
STA	High level for 35ms Low level for 500ms	Not connecting to any network
	High level for 70ms Low level for 1000ms	Connecting to network
	High level for 23ms Low level for 333ms	Sending data to 2G network
	High level for 11ms Low level for 163ms	Sending data to 3G network
LINKA	ON	Socket A is connected
	OFF	Socket A is not connected
LINKB	ON	Socket B is connected
	OFF	Socket B is not connected

Figure 13 LED indicator

2.4.1. Reload by Hardware

User default settings: User can save the settings as User default settings.

Pressed Reload button for 3~15 seconds, USR-G761w will reload user default settings.

3. Parameter Setting

For configuring module and querying status, there are 3 ways to use AT command. They are serial AT command, SMS AT command and transparent AT command. We provide the setup software based on serial AT command. You can download the setup software in our website www.usriot.com.

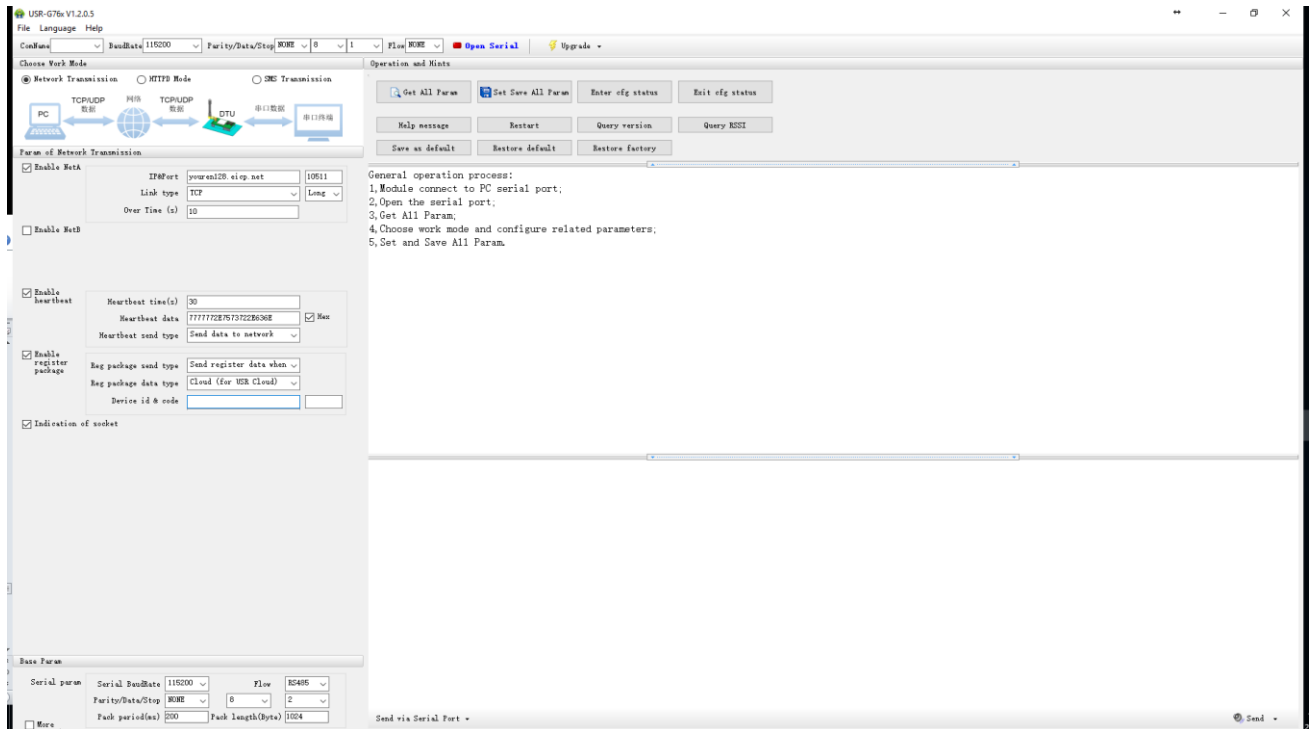


Figure 14 Setup software

3.1. AT Command

3.1.1. Serial AT Command

In transparent mode, SMS mode and HTTPD mode, you can enter AT command mode. Then you can send AT command to module. Setup software is based on this function. For entering AT command mode, please refer to this FAQ: <http://www.usriot.com/enter-serial-command-mode/>.

3.1.2. Transparent AT Command

When module in transparent mode, you can use “Password,AT command” format to send AT command via serial or network. If you use transparent AT command, you needn’t enter AT command mode.

3.1.3. SMS AT Command

You can configure module or query status by SMS AT command. It is for your remote control your module in fields.

4. Contact Us

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5. Disclaimer

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6. Update History

2016-08-05 V1.0.1 Established

2016-08-19 V1.0.2 Audited by testing team, modify basic parameter registration package function

2016-08-19 V1.0.3 Audited by FAE, modify some wrong name, add samples of AT command

2016-10-27 V1.0.3.1 First English type

2016-11-07 V1.0.3.4 Composing

2016-11-07 V1.0.3.5 Add APN description

2016-11-15 V1.0.3.6 Modify diagram of structure

2016-11-16 V1.0.3.7 Modify diagram of structure